ORDER NO. AD9205163C8

Service Manual

MASH*
multi-stage noise shaping

Portable CD Player

SL-XP330

Colour

(K)... Black Type

Area

Suffix for Model No.	Area	Colour
(EB)	Great Britain.	(K)
(EG)	Europe.	
(GC)	Asia, Latin America, Middle Near East and Africa.	
(GN)	Oceania.	

※
- Technics (or Panasonic) developed the world's first MASH type DAC and ADC. MASH technology was invented by NTT (LSI Labs).
- MASH is a trademark of NTT.

SL-XP6 MECHANISM SERIES (S0DD100Z)

■ SPECIFICATIONS

■ Audio

No. of channels: 2 channels (left and right, stereo)
Output voltage: 0.7V (50kΩ) φ3.5
Frequency response: 20~20000Hz (+0.5dB, −1.5dB)
Dynamic range: more than 94dB
S/N ratio: more than 99dB
Wow and flutter: Below measurable limit
D/A converter: 1 bit, MASH※
Headphones output level: max. 15mW/16Ω φ3.5 (adjustable)

■ Signal Format

Correction system: Technics New Super Decoding Algorithm

■ Pickup

Type: One beam
Light source: Semiconductor laser
Wavelength: 780nm
Lens: Glass pressed lens

■ General

Power requirement: AC; with an included panasonic AC adaptor [RFEA401B-W (EB), RFEA401E-1S (EG), RFEA402Z-W (GC), RFEA401A-W (GN)]
Batteries; 3V (two "AA" size batteries, not included)
(Panasonic UM-3/R6P, AM3/LR6 or equivalent, not included)
Rechargeable Batterries; DC 2.4V with an included Panasonic Rechargeable Batteries [RP-BP60EY (EB, EG), RP-BP60SY-1 (GC, GN)]
Car Battery; with an optional panasonic car adaptor (SH-CDC9)
DC IN: 4.5V ⊖-⊂-⊕
Power consumption:
AC adaptor; 3W
Battery; 0.65W (DC 3V)
Dimensions (W × H × D): 128 × 29 × 148mm
Weight: 330g (with rechargeable batteries)

Note: Design and specifications are subject to change without notice.
Weight and dimensions are approximate.

Technics

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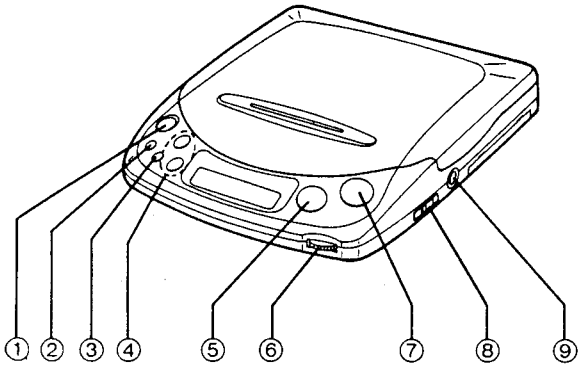
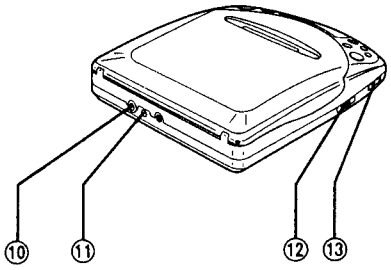
■ LOCATION AND FUNCTION OF CONTROLS

Player controls





① **Open button (OPEN)**

② **Memory/recall button (MEMORY/RECALL)**
Use to program tracks or to confirm the contents of program.

③ **Repeat button (REPEAT)**
Press to activate the one track repeat and the all repeat functions.

④ **Skip/search buttons (I◄◄-SKIP/-SEARCH ►►I)**
Press to move forward and backward through the tracks on the disc, or to hear the disc sound when searching at high speed while playing.

⑤ **Stop/operation off button (■ STOP/OPR OFF)**

⑥ **Earphones/headphones' volume control (VOLUME)**

⑦ **Play/pause button (► II PLAY/PAUSE)**

⑧ **ASC/S-XBS selector (ASC/S-XBS)**
Use to change the tone quality (earphones only).

⑨ **Earphones/headphones jack (∩) 16Ω φ3.5**

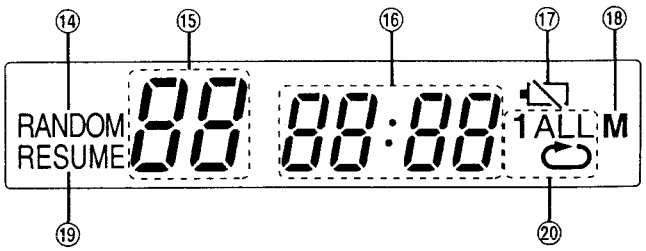
⑩ **Out jack (OUT) 50kΩ φ3.5**

⑪ **DC in jack (DC IN 4.5 V ⊖-(•)-⊕)**

⑫ **Play mode selector (PLAY MODE)**
Use to select the following play modes:
RESUME: Resume function
NORMAL: Sequential and program play
RANDOM: Random play

⑬ **Hold switch (HOLD)**
Use to prevent unintended operation. You cannot open the disc holder and activate functional buttons when player is in the hold state. The display window shows "hold" (hold). Before operating the front panel buttons, be sure to release the player from the hold state.

Display



⑭ **Random indicator (RANDOM)**
Lights during the random play mode.

⑮ **Track display**
Shows the number (up to 99) of the track.

⑯ **Time display**
Shows the elapsed playing time of the current track and the total playing time of the disc.

⑰ **Battery check indicator ( )**
Flashes on and off when the batteries are weak.

⑱ **Memory indicator (M)**
Lights during the program play mode.

⑲ **Resume indicator (RESUME)**
Lights when the resume mode.

⑳ **Repeat indicators**
One track repeat indicator (1)
All track repeat indicator (ALL)

■ PRECAUTION OF LASER DIODE

CAUTION: This product utilizes a laser diode with the unit turned "on", invisible laser radiation is emitted from the pickup lens.
Wave length: 780nm
Maximum output radiation power from pickup: 100μW/VDE

Laser radiation from the pickup lens is safety level, but be sure the followings:

1. Do not disassemble the optical pickup unit, since radiation from exposed laser diode is dangerous.
2. Do not adjust the variable resistor on the pickup unit. It was already adjusted.
3. Do not look at the focus lens using optical instruments.
4. Recommend not to look at pickup lens for a long time.

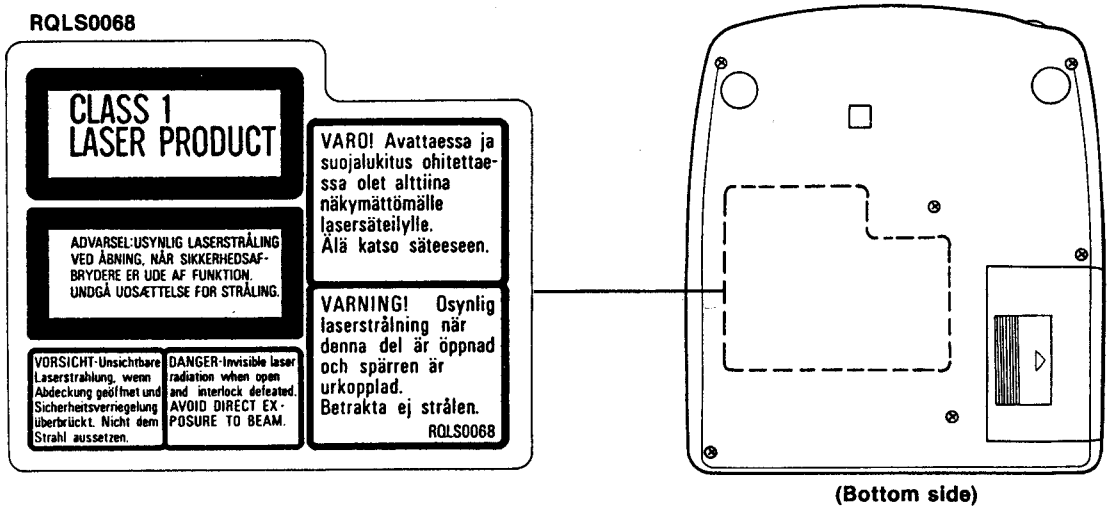
ACHTUNG: Dieses Produkt enthält eine Laserdiode. Im eingeschalteten Zustand wird unsichtbare Laserstrahlung von der Lasereinheit abgestrahlt.

Wellenlänge: 780nm
Maximale Strahlungsleistung der Lasereinheit: 100μW/VDE

Die Strahlung an der Lasereinheit ist ungefährlich, wenn folgende Punkte beachtet werden:

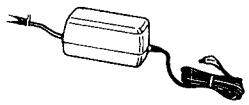
1. Die Lasereinheit nicht zerlegen, da die Strahlung an der freigelegten Laserdiode gefährlich ist.
2. Den werkseitig justierten Einstellregler der Lasereinheit nicht verstellen.
3. Nicht mit optischen Instrumenten in die Fokussierlinse blicken.
4. Nicht über längere Zeit in die Fokussierlinse blicken.

ADVARSEL: I dette a apparat anvendes laser.

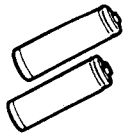

RQLS0068
CLASS 1
LASER PRODUCT
ADVARSEL:USYNLIG LASERSTRÅLING VED ÅBNING, NÅR SIKKERHEDSAFBRYDERE ER UDE AF FUNKTION. UNDGÅ UDSÆTTELSE FOR STRÅLING.
VORSICHT-Unsichtbare Laserstrahlung, wenn Abdeckung geöffnet und Sicherheitsverriegelung überbrückt. Nicht dem Strahl aussetzen.
DANGER-Invisible laser radiation when open and interlock defeated. AVOID DIRECT EXPOSURE TO BEAM.
VARO! Avattaessa ja suojalukitus ohitettaessa olet alttiina näkymättömälle lasersäteilylle. Älä katso säteeseen.
VARNING! Osynlig laserstrålning när denna del är öppnad och spärren är urkopplad. Betrakta ej strålen.
RQLS0068

(Bottom side)

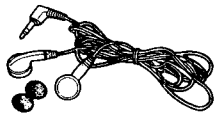
■ ACCESSORIES



AC adaptor ..... 1 pc.
(RFEA401B-W): (EB)
(RFEA401E-1S): (EG)
(RFEA402Z-W): (GC)
(RFEA401A-W): (GN)



Rechargeable batteries ..... 2 pcs.
(RP-BP60EY): (EB, EG)
(RP-BP60SY-1): (GC, GN)



Stereo earphones ..... 1 pc.
(RP-HV135GY)

Stereo connection cable ..... 1 pc.
(SJPD5-2K)

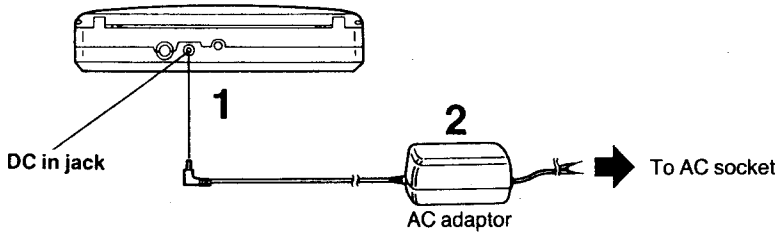
Note:
The configuration of the AC adaptor differs according to area.

■ POWER SOURCE

This player can operate on any of 4 different power sources: AC adaptor or rechargeable batteries—included; or car adaptor or LR6 dry cell batteries (UM-3)—not included.

AC adaptor

Use only the AC adaptor provided with this player.

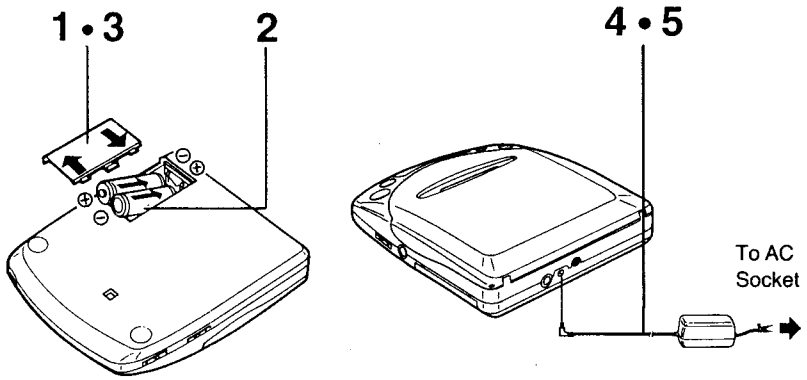


1 Insert the plug at the end of the AC adaptor cord into the DC in jack.

2 Plug the AC adaptor into your household AC power outlet.

CAUTION
Do not use the AC adaptor provided with this player for other products.

Rechargeable batteries



CAUTION
- Before inserting the rechargeable batteries to charge, be sure to turn off the player.
- Recharge the rechargeable batteries for 3 hours before using them for the first time and any time they have not been used for a long period (more than three months). If 3 hours recharging does not provide normal operation time (2.5 hours), repeat the recharging for 3 more hours.
- Normally, 3 hour of recharging will give approximately 2.5 hours of play.

1 Open the battery compartment cover.
Press gently and slide the cover out from the cabinet.

2 Insert the rechargeable batteries.
- Use the two rechargeable batteries supplied with this player. Be sure to install the batteries.
- You can operate the player with the AC adaptor while recharging the batteries, but it will lengthen the recharging time.

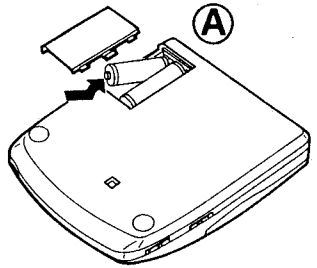
3 Close the battery compartment cover.

4 Connect the AC adaptor to the player and to your household AC power outlet.

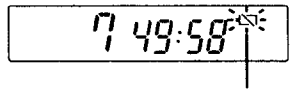
5 Disconnect the AC adaptor in about 3 hours.

CAUTION
- Do not allow metal objects to touch the terminals. (A hazardous short circuit may result.)
- The batteries supplied with this player are designed for Technics-brand portable audio products only. Use in other products could cause damage or personal injury.
- Avoid recharging or placing the rechargeable battery near sources of heat or humidity. Recharging should be performed at 0°C–40°C.
- While recharging,the AC adaptor and rechargeable batteries may get warm. This is normal.

■ Battery removal
Press the batteries toward Ⓐ and remove them.

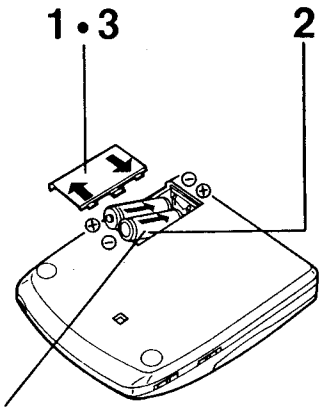


■ Rechargeable battery life
You can recharge these rechargeable batteries about 300 times. After that, their operating time will be shortened, and you will need to replace them.
- Observe the battery check indicator on the display to determine battery condition. When the batteries are weak, the battery check indicator begins to flash on and off and then the player will be automatically turned off.



Battery check indicator

Dry cell batteries (optional)



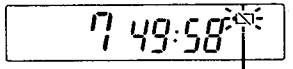
LR6 (UM-3) dry cell batteries

Make sure that the AC adaptor is unplugged from the wall outlet and the player.

1 Open the battery compartment cover.

2 Insert LR6 (UM-3) batteries.

- Install the battery first and then push in the direction of the arrow. Batteries installed with incorrect polarities may leak and damage the player.
- If batteries should leak and the leaking electrolyte comes into contact with skin or clothes, flush with water immediately. If the internal parts of a battery become visible because of damage to the battery, discard it immediately.
- You can also check battery condition by the battery check indicator. The indicator begins flashing on and off when the battery is half-used. Use of alkaline batteries will give approximately 6.5 hours play.

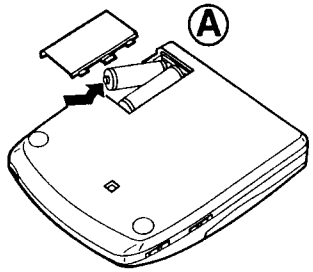


Battery check indicator

3 Close the battery compartment cover.

■ Battery removal

Press the batteries toward Ⓐ and remove them.



Car adaptor (optional)

CAUTION

Use only car adaptor, Model: SH-CDC9, manufactured by Matsushita Electric Industrial Co., Ltd.

Follow the operating instructions included with the optional car adaptor.

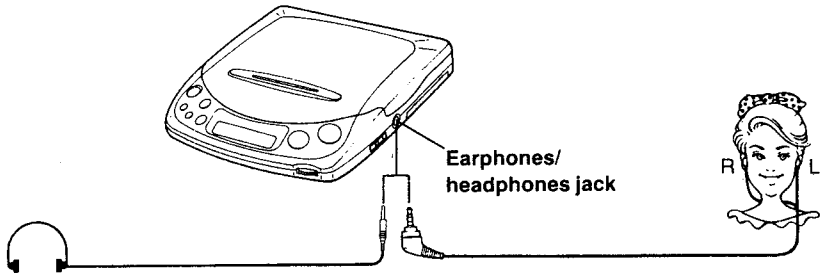
The rechargeable battery can be recharged with the car adaptor.

Please purchase the optional car mounting kit (SH-CDF7) and the car stereo cassette adaptor (SH-CDM7) before using this unit in a car.

■ CONNECTIONS

You can use this player through an audio system, portable AM/FM cassette system, and/or stereo earphones/headphones.

Listening through the stereo earphones (or headphones)

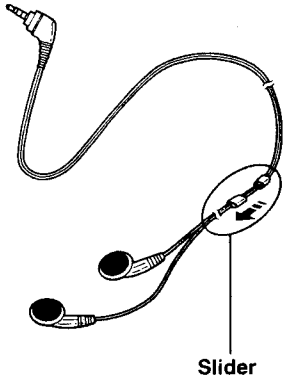


Headphones (not included)

Stereo earphones (included)

Connect the plug of the stereo earphones (included) or headphones (not included) to the earphones/ headphones jack.

Note for stereo earphones:
The right earphone cord is longer than the left and is adjustable for your convenience.

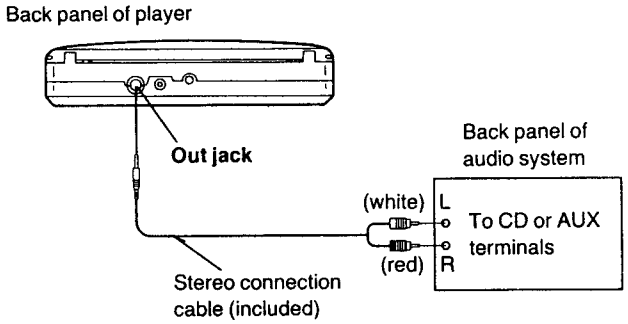


Slides up to prevent entangling of the cord when the stereo earphones are not in use.

Listening through an audio system

Before connecting the player to your audio system or portable AM/FM cassette system, make sure that the power of the player and all other system components are turned off.

See the operating instructions for your system components or portable AM/FM cassette system for details.



Use the stereo connection cable (included) to connect this player to an amplifier/receiver or portable AM/FM cassette system.

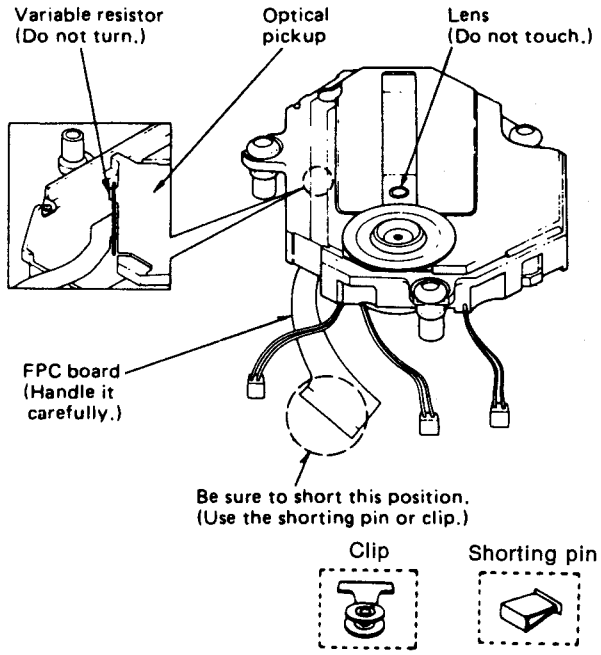
Do not connect this player to the PHONO terminals of the receiver or portable AM/ FM cassette system.

■ HANDLING PRECAUTIONS FOR TRAVERSE DECK

The laser diode in the traverse deck (optical pickup) may break down due to potential difference caused by static electricity of clothes or human body.
So, be careful of electrostatic breakdown during repair of the traverse deck (optical pickup).

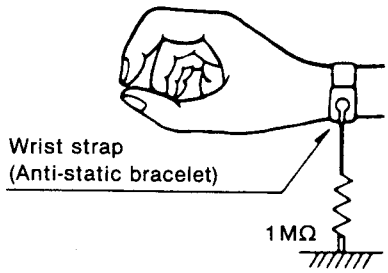
• Handling of traverse deck (optical pickup)

1. Do not subject the traverse deck (optical pickup) to static electricity as it is extremely sensitive to electrical shock.
2. To prevent the breakdown of the laser diode, an antistatic shorting pin is inserted into the flexible board (FPC board).
   When removing or connecting the short pin, finish the job in as short time as possible.
3. Take care not to apply excessive stress to the flexible board (FPC board).
4. Do not turn the variable resistor (laser power adjustment). It has already been adjusted.

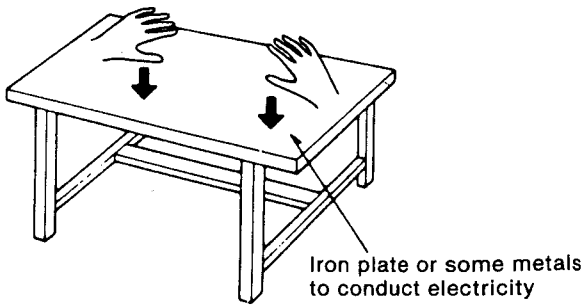


• Grounding for electrostatic breakdown prevention

1. Human body grounding.
   Use the anti-static wrist strap to discharge the static electricity from your body.
2. Work table grounding
   Put a conductive material (sheet) or steel sheet on the area where the traverse deck (optical pickup) is placed, and ground the sheet.



Caution:
The static electricity of your clothes will not be grounded through the wrist strap. So, take care not to let your clothes touch the traverse deck (optical pickup).

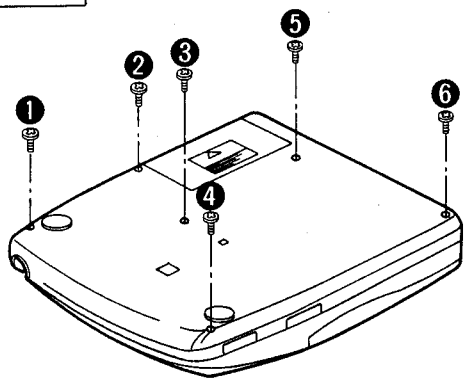


■ DISASSEMBLY INSTRUCTIONS

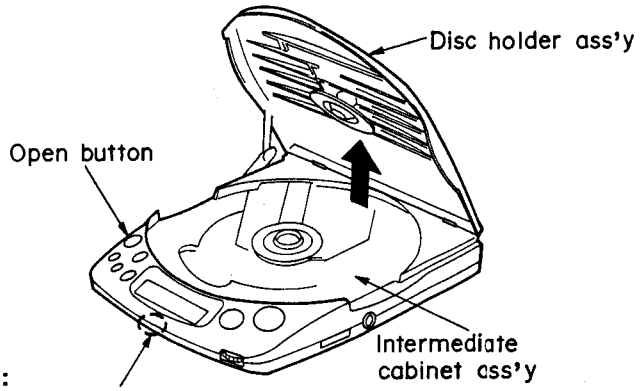
Warning: This product uses a laser diode. Refer to caution statements on page 3.

※ This CD player is equipped with FPC boards, so handle them with care during disassembly and reassembly.

Ref. No. 1	Removal of the intermediate cabinet ass'y
Procedure 1	



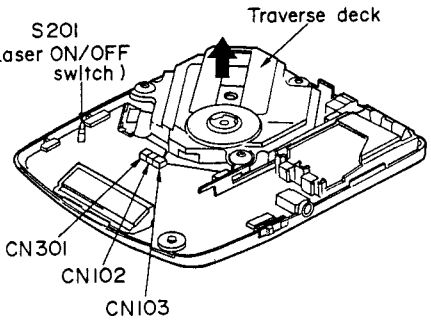
1. Remove the 6 screws (❶~❻).



Note:
Take care not to break a claw.

2. Push the open button and open the disc holder ass'y.
3. Remove the intermediate cabinet ass'y in the direction of arrow.

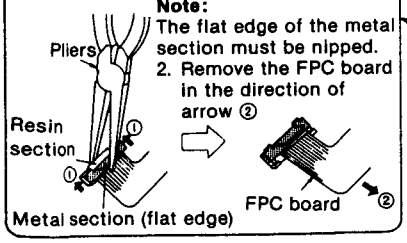
Ref. No. 2	Removal of the traverse deck
Procedure 1→2	

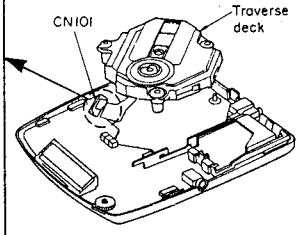


1. Disconnect the connectors (CN102, CN103, CN301).
2. Pull out the traverse deck in the direction of arrow.

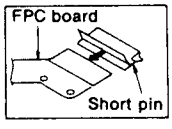
How to remove the FPC board.
1. Nip the metal and resin sections of the connector with a pair of pliers and then move the metal section in the direction of arrows ①.

Note:
The flat edge of the metal section must be nipped.
2. Remove the FPC board in the direction of arrow ②



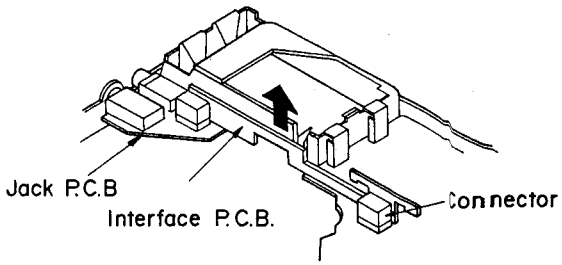


3. Remove the FPC board (CN101).

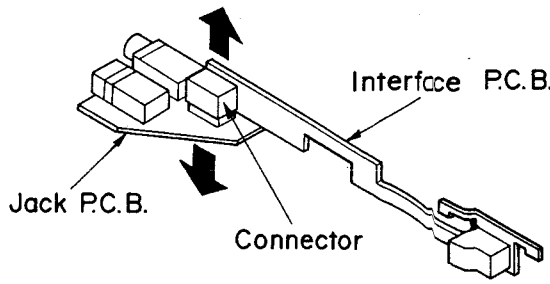


Caution:
Insert a short pin into the traverse deck's FPC board. (Refer to "handling precautions for traverse deck" on page 8.)

Ref. No. 3	Removal of the interface P.C.B. and jack P.C.B.
Procedure 1→2→3	

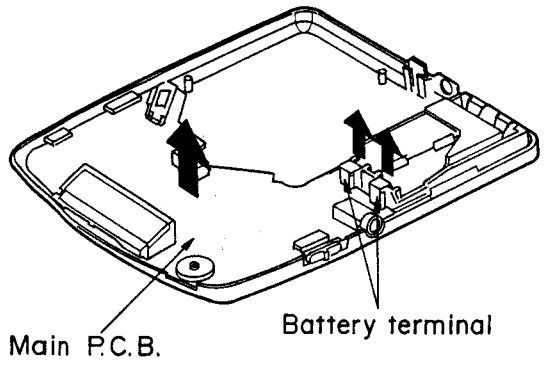


1. Remove the interface P.C.B. in the direction of arrow with carefully.



2. Separate the interface P.C.B. and jack P.C.B. in the direction of arrow.

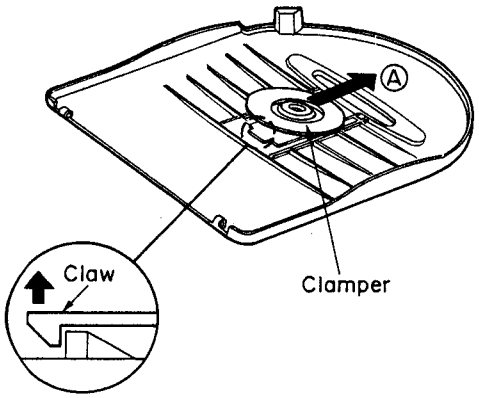
Ref. No. 4	Removal of the main P.C.B.
Procedure 1→2→3→4	



• Remove the main P.C.B. and battery terminal.

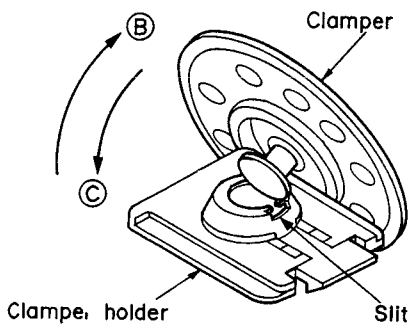
Ref. No. 6	Removal of the clamper
Procedure 1→5→6	

1. Remove the claw.
2. Remove the clamper in the direction of arrow Ⓐ.

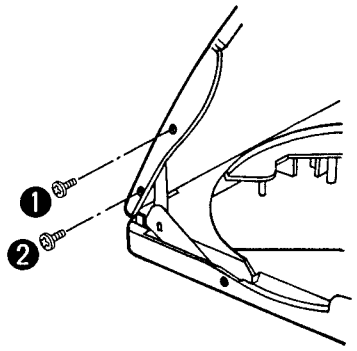


3. Put together clamper and clamper holder in the direction of slit.
4. Remove the clamper from clamper holder in the direction of arrow Ⓑ.

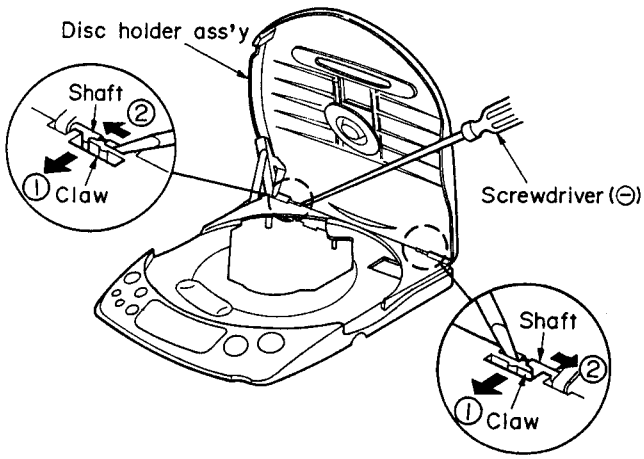
Note: When attach the clamper, insert it in the direction of arrow Ⓒ.



Ref. No. 5	Removal of the disc holder ass'y
Procedure 1→5	

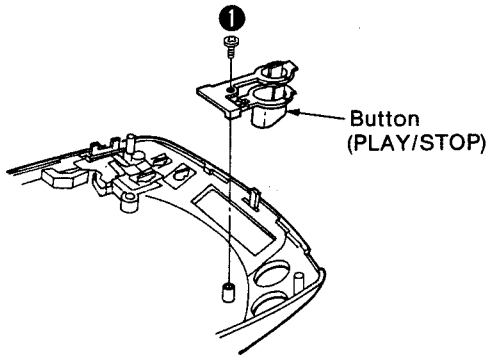


1. Remove the 2 screws (❶, ❷).



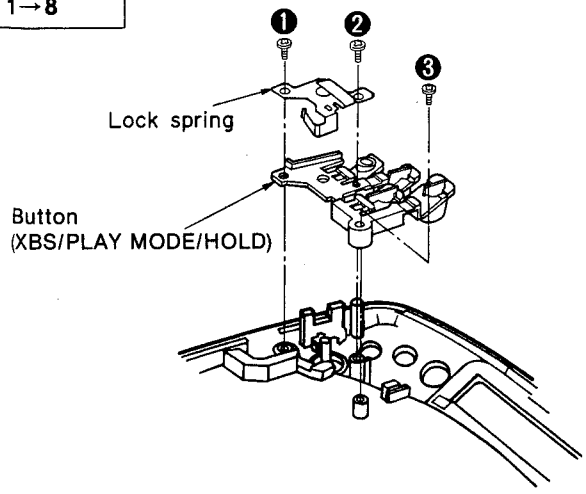
2. Remove the shaft in the direction of arrow ② by keeping the claw pressed in the direction of arrow ①.

Ref. No. 7	Removal of the button (PLAY/STOP)
Procedure 1→7	

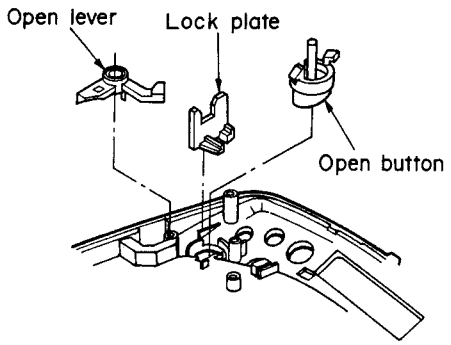


• Remove the 1 screw (❶).

Ref. No. 8	Removal of the lock spring, button (XBS/PLAY MODE/HOLD), open lever, lock plate and open button
Procedure 1→8	

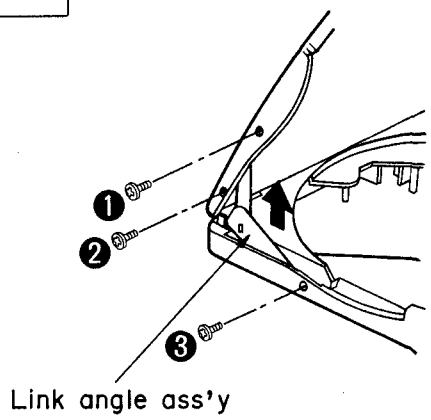


1. Remove the 3 screws (❶~❸).
2. Remove the lock spring and operation button (B).



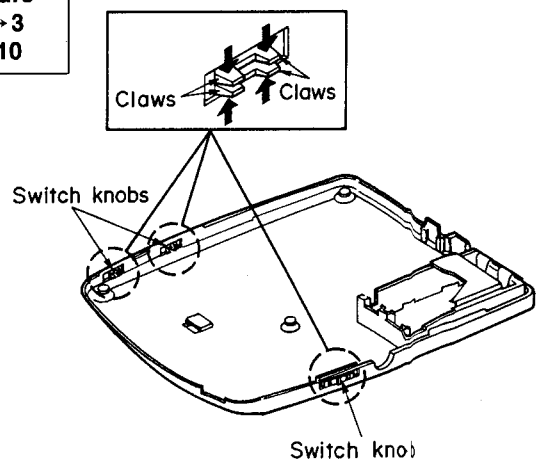
3. Remove the open lever, lock plate and open button.

Ref. No. 9	Removal of the link angle ass'y
Procedure 1→9	



1. Remove the 3 screws (❶~❸).
2. Remove the link angle in the direction of arrow.

Ref. No. 10	Removal of the switch knobs
Procedure 1→2→3 →4→10	

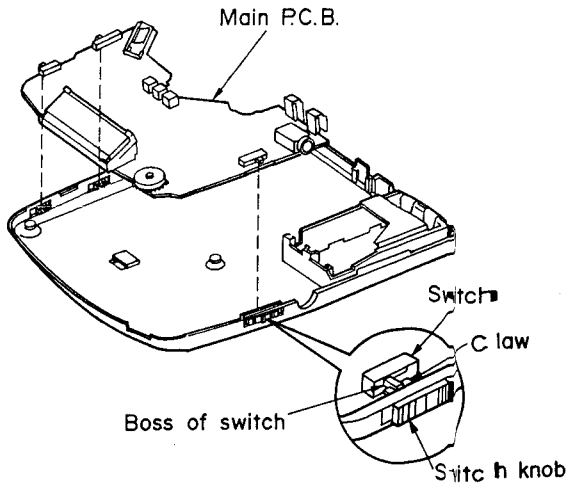


- Push the claws in the direction of arrows, and remove the switch knobs.

■ NOTES FOR ASSEMBLY

- **How to install the main P.C.B.**
- Make sure the bosses of the switch are fit in the claws of switch knob when inserting the switch knob.

*Before installing the switch knob, be sure to check the claws for defects that would render the claws unserviceable. (If a white line like white wax on a claw is found, the claw may be broken when installing the switch knob.)

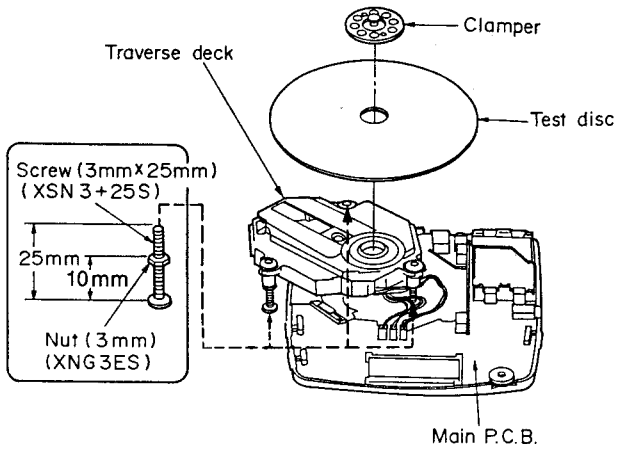


■ HOW TO CHECK THE MAIN P.C.B. (COMPONENT SIDE)

1. Remove the intermediate cabinet ass'y. (See Ref. No. 1 of the disassembly instructions.)
2. Remove the clamper. (See Ref. No. 6 of the disassembly instructions.)
3. Hold up the traverse deck from the unit and then set it on the screw and nut. (Refer to right figure.)
4. Set the test disc and clamper in the traverse deck.
5. Short the short land of the laser ON/OFF SW (S201) by soldering it. (See page 15.)

   Note: After checking the P.C.B., remove the solder from the land.

6. With the P.C.B. in place as shown in the figure right, connect the AC adaptor to the DC IN jack, press the play button and then check the voltage and waveform.



■ HOW TO CHECK THE MAIN P.C.B. (FOIL SIDE)

1. Remove the intermediate cabinet ass'y. (See Ref. No. 1 of the disassembly instructions.)
2. Remove the traverse deck, main P.C.B. and jack P.C.B. from the bottom cabinet ass'y.
3. Short the short land of the laser ON/OFF SW (S201) by soldering it. (See page 15.)

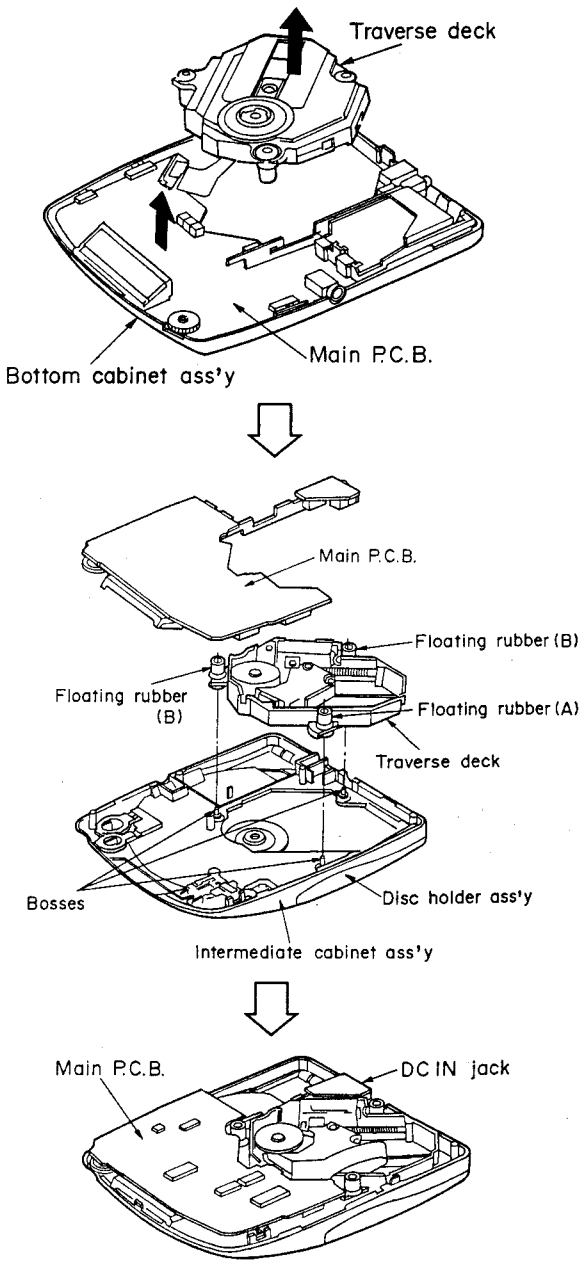
   Note: After checking the P.C.B., remove the solder from the short land.

4. Install the traverse deck and P.C.B. in the intermediate cabinet ass'y.
5. Install the unit in place by holding the traverse deck and P.C.B. firmly, and then install the disc.

   Note:

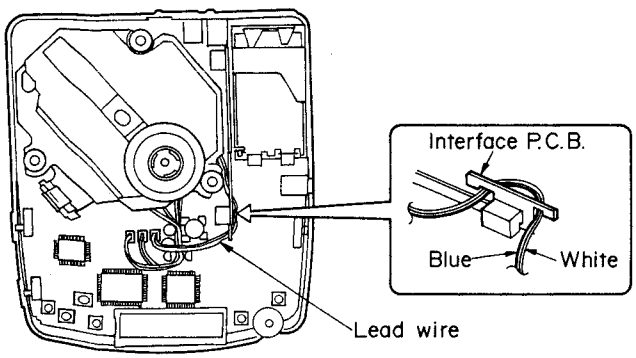
   Engage the floating rubber of the traverse deck in the bosses on the intermediate cabinet ass'y.

6. With the P.C.B. in place as shown in the figure right, connect the AC adapter to the DC IN jack, press the play button and then measure the voltage and waveform.



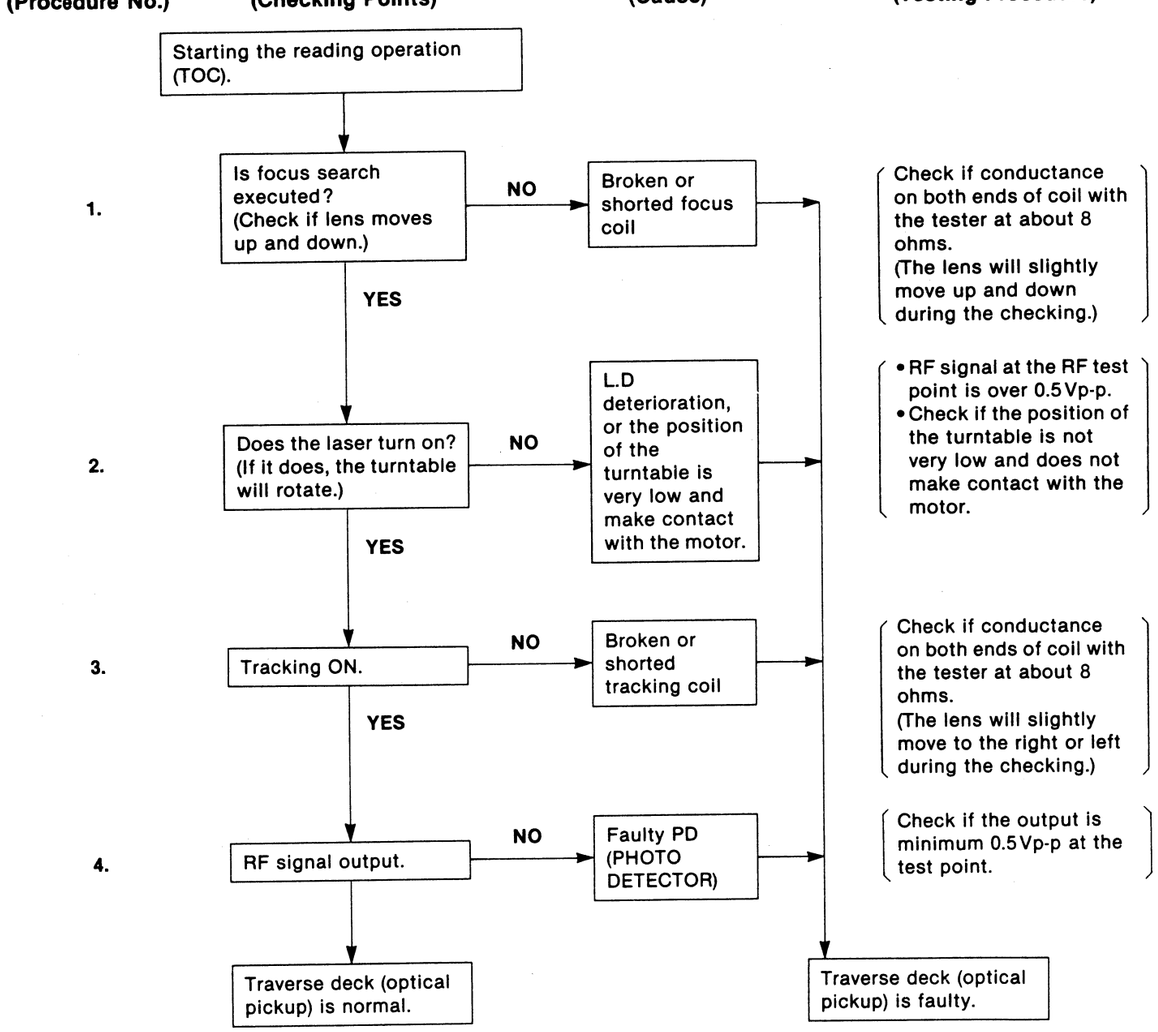
■ ABOUT THE WIRE PROCESSING

- Process the lead wires with the interface P.C.B. as shown below.



■ CHECKING THE OPERATION PROBLEMS ON THE TRAVERSE DECK (OPTICAL PICKUP)

Make sure to follow the procedures below to check the operation problems of the traverse deck (optical pickup) before replacing it. Replace the traverse deck only after the problem is identified.


(Procedure No.)
(Checking Points)
(Cause)
(Testing Procedure)
Starting the reading operation (TOC).
1.
Is focus search executed? (Check if lens moves up and down.)
NO
Broken or shorted focus coil
Check if conductance on both ends of coil with the tester at about 8 ohms. (The lens will slightly move up and down during the checking.)
YES
2.
Does the laser turn on? (If it does, the turntable will rotate.)
NO
L.D deterioration, or the position of the turntable is very low and make contact with the motor.
• RF signal at the RF test point is over 0.5Vp-p.
• Check if the position of the turntable is not very low and does not make contact with the motor.
YES
3.
Tracking ON.
NO
Broken or shorted tracking coil
Check if conductance on both ends of coil with the tester at about 8 ohms. (The lens will slightly move to the right or left during the checking.)
YES
4.
RF signal output.
NO
Faulty PD (PHOTO DETECTOR)
Check if the output is minimum 0.5Vp-p at the test point.
Traverse deck (optical pickup) is normal.
Traverse deck (optical pickup) is faulty.

- Check electrical circuit.
- Check for flaws on disc or if it is warped or not centered.

※ Replace traverse deck.

• Check the operations described below on the traverse deck after replacing it.

* Checking Skip Search
1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and reverse directions).

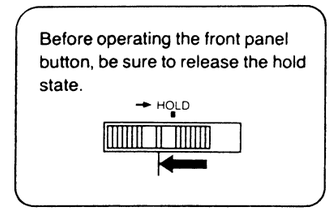
* Checking Manual Search
1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and reverse directions).

* Checking Playability
1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

■ NOTE FOR SERVICE

• About hold switch

Before checking the operation problems and adjustments, be sure to release the hold state.

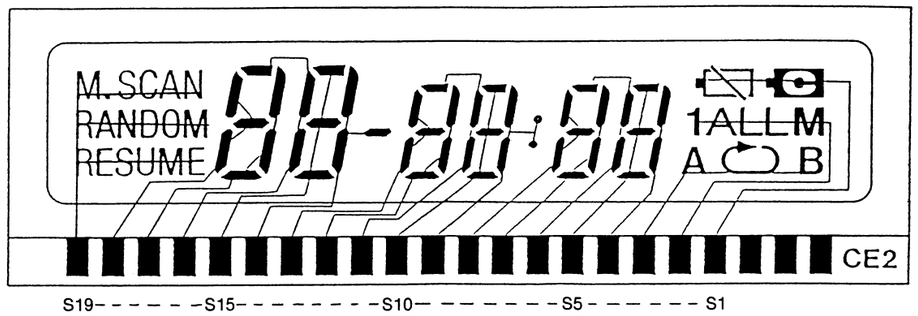


• Connection of the FPC board of the optical pickup

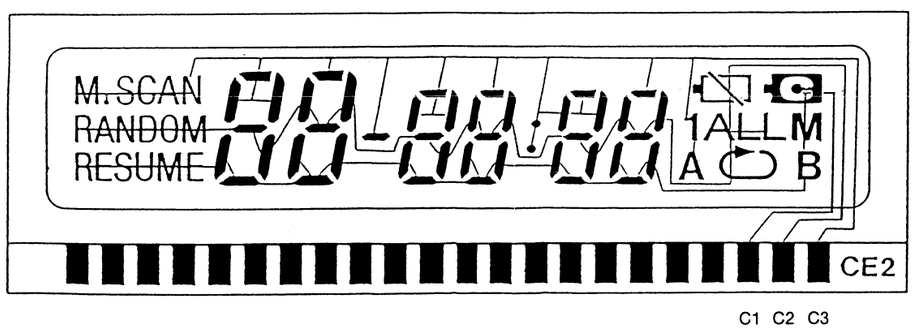
Before you put the power supply to work from the AC adaptor or batteries to check the set's operations and voltage, be sure to connect the FPC board of the optical pickup to the connector CN101 on the main P.C.B. If you disconnected the FPC board from the connector CN101, the protection circuitry may be operated when the PLAY/PAUSE button is pressed with the FPC board disconnected.

■ INTERNAL CONNECTIONS OF LCD

• Segment connection diagram



• Common connection diagram



■ MEASUREMENTS AND ADJUSTMENTS

Warning: This product uses a laser diode. Refer to caution statements on page 3.

ACHTUNG: • Die lasereinheit nicht zerlegen.
• Die lasereinheit darf nur gegen eine vom hersteller spezifizierte einheit ausgetauscht werden.

• Measuring instruments and special tools

• Test discs

1. Playability test disc (SZZP1054C)
2. Uneven test disc (SZZP1056C)

- Musical program disc (ordinary)
- DC voltmeter
- Lead wire (for test points)

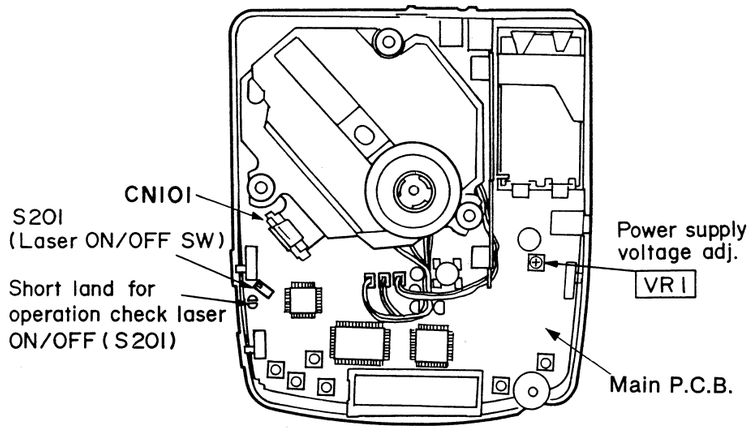
• Test short land

Short-circuit the lands of the laser ON/OFF switch (S201) by soldering them. It turns "ON" position. (Refer to below figure or printed circuit board and wiring connection diagram for short land location.)

Note: Remove the solders from the lands after adjustment.

• Adjustment point

Notes) 1. Please refer to the printed circuit board and wiring connection diagram for test point locations.
2. Take care to connect CN101.



• Adjustment procedure

(1) POWER SUPPLY VOLTAGE ADJUSTMENT

1. Connect the DC voltmeter to TP103 (VCC) (+) and TP104 (GND).
2. Insert the full recharging two rechageable batteries.
3. Insert the test disc, and switch the player power ON.
4. Adjust **VR1** on the main P.C.B. at **4.05±0.05V**.

(2) CHECK OF PLAY OPERATION

* **Checking Skip Search**

1. Play an ordinary musical program disc.
2. Press the skip button to check for normal skip search operation (in both the forward and backward directions).

* **Checking Manual Search**

1. Play an ordinary musical program disc.
2. Press the manual search button to check for smooth manual search operations at either low or high speed (in both the forward and backward directions).

* **Checking Playability**

1. Play the 0.7mm black dot and the 0.7mm wedge on the playability test disc (SZZP1054C) and verify that no sound skip or noise occurs.
2. Play the middle tracks of the uneven test disc (SZZP1056C) and verify that no sound skip or noise occurs.

• Automatic adjustment

On our conventional type portable CD player, there were mounted 6 semi-fixed controls for each adjustment. Since the SL-XP330 servo circuit is equipped with an automatic adjusting circuit, these controls are removed from SL-XP330.

On conventional portable CD player		On SL-XP330
1. Tracking Offset Adjustment VR (TOC) 2. Focus Offset Adjustment VR (FOC)	➡	Non Adjustment
3. Tracking Gain Adjustment VR (TGC) 4. Focus Gain Adjustment VR (FGC) 5. Tracking Balance Adjustment VR (TBC) 6. Focus Balance Adjustment VR (FBC)	➡	Automatic Adjusting Circuit
Total 6 Adjustment VRs	➡	No Adjustment VR

Although all discs are manufactured according to the same specifications, their characteristics are not always precisely the same because they are produced by different manufacturers in various lots, or have different warp etc.
SL-XP330 automatically controls the servo circuit to obtain optimum performance according to any disc's characteristics. Therefore, no malfunction occurs because of mis-adjustment.

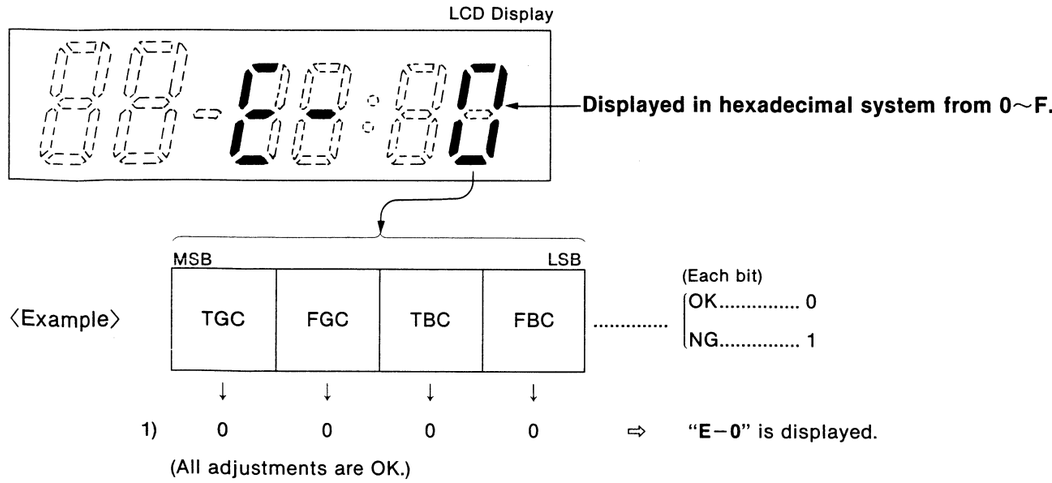
■ DISPLAY FUNCTION OF AUTOMATICALLY-ADJUSTED RESULTS (SELF-CHECK FUNCTION)

On this nuit (SL-XP330), each automatically-adjusted result are displayed on the LCD. This function is convenient to check or identify which automatic adjustment circuit is incorrect. The followings are the contents of the automatically-adjusted result displays (self-check function).

• How to display automatically-adjusted results

1. Load the test disc (SZZP1054C).
2. Press the I◀◀ (SKIP/SEARCH) and ▶▶I (SKIP/SEARCH) Buttons simultaneously and hold them, and additionally press the ▶/II (PLAY/PAUSE) Button.
3. Press the ◉ (STOP/POWER OFF) Button once.
4. An automatically-adjusted result is displayed on the LCD. (Refer to the next page.)

• Display of automtically-adjusted results (self-check function)



2) 0 (OK) 1 (NG) 0 (OK) 0 (OK) ⇨ "**E−4**" is displayed.

(Focus gain adjustment is NG (incorrect.)

3) 1 (NG) 0 (OK) 1 (NG) 0 (OK) ⇨ "**E−A**" is displayed.

(Tracking gain and tracking balance adjustments are NG.)

4) 1 (NG) 1 (NG) 1 (NG) 1 (NG) ⇨ "**E−F**" is displayed.

(All adjustments are NG.)

〈Example〉 **Follow the below steps when "E−4" is displayed.**

(Cause: Focus gain is set beyond the limit.)

• Check if

(1) the waveform or voltage of the focus servo circuit is correct,

(2) the focus coil of the optical pickup is correct (around 8 ohms), and

(3) the optical pickup returns to the normal state by exchanging the traverse deck.

Follow the below steps when "E−1" is displayed.

(Cause: Focus balance is set beyond the limit.)

• Check if

(1) R101 (4 resistors) is not defective by measuring the value,

(2) the waveform or voltage of the focus servo circuit is correct, and

(3) the optical pickup returns to the normal state by exchanging the traverse deck.

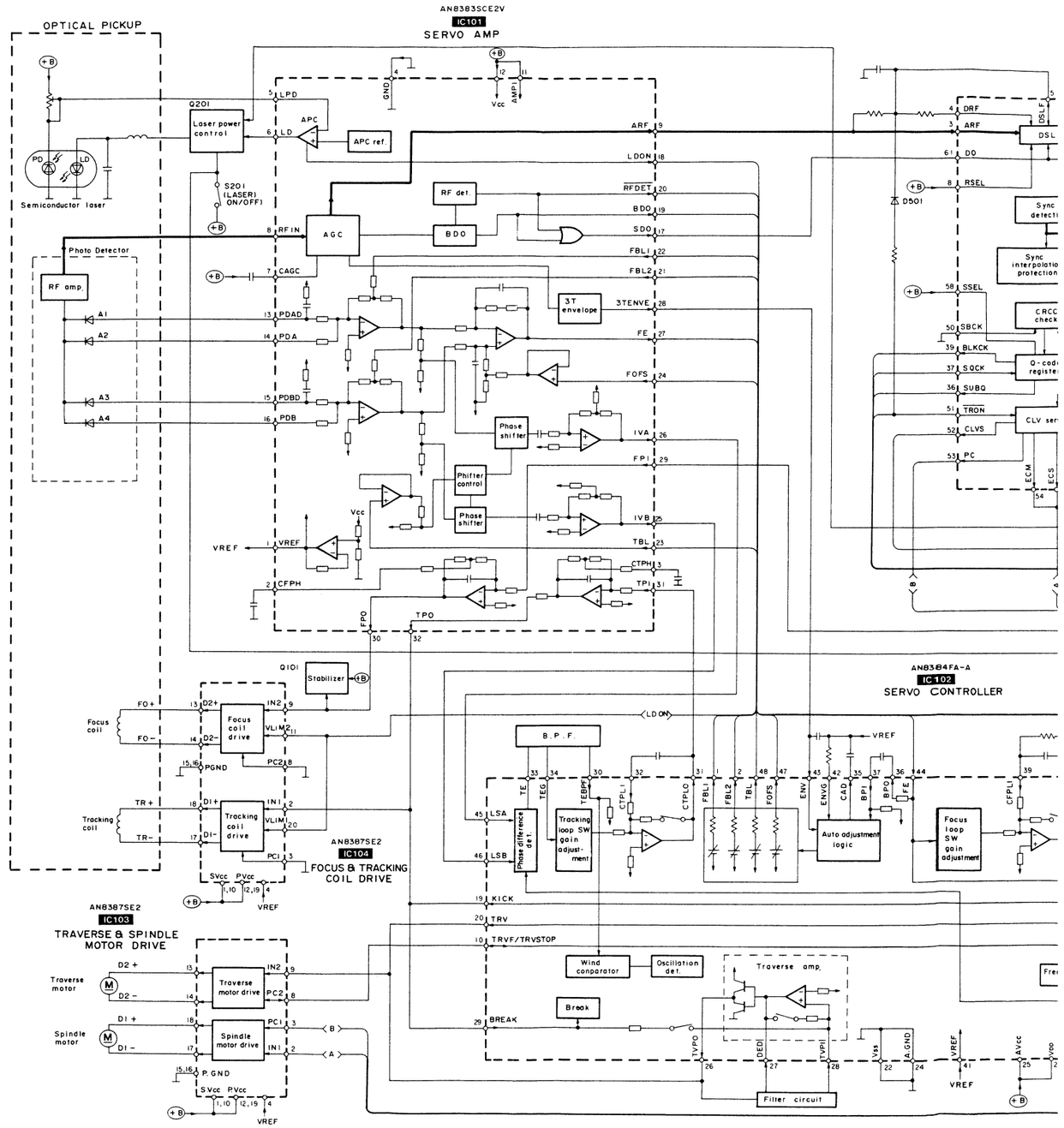
Note:

It is not always necessary to exchange the traverse deck when an error message is displayed. Be sure to check if the circuit is defective or not before exchanging the traverse deck.

Note:

If any other disc than the test disc (SZZP1054C) is used, an error message may be displayed. This is not a malfunction.

■ BLOCK DIAGRAM



MN6626
IC501
DIGITAL SIGNAL PROCESSOR

MN6475A-TI
IC601
DIGITAL FILTER & D/A CONVERTER

AN8384FA-A
IC102
SERVO CONTROLLER

UPD753086038
IC301
SYSTEM CONTROL & LCD DRIVE

NJM3415MTI
IC701(1/2)

AN8086SE2
IC1
DC-DC CONVERTER CONTROL

Note:
→ Audio signal

■ SCHEMATIC DIAGRAM

(Parts list on pages 33, 34, 36, 37.)

(This schamtic diagram may be modified at any time with development of new technology.)

Notes:

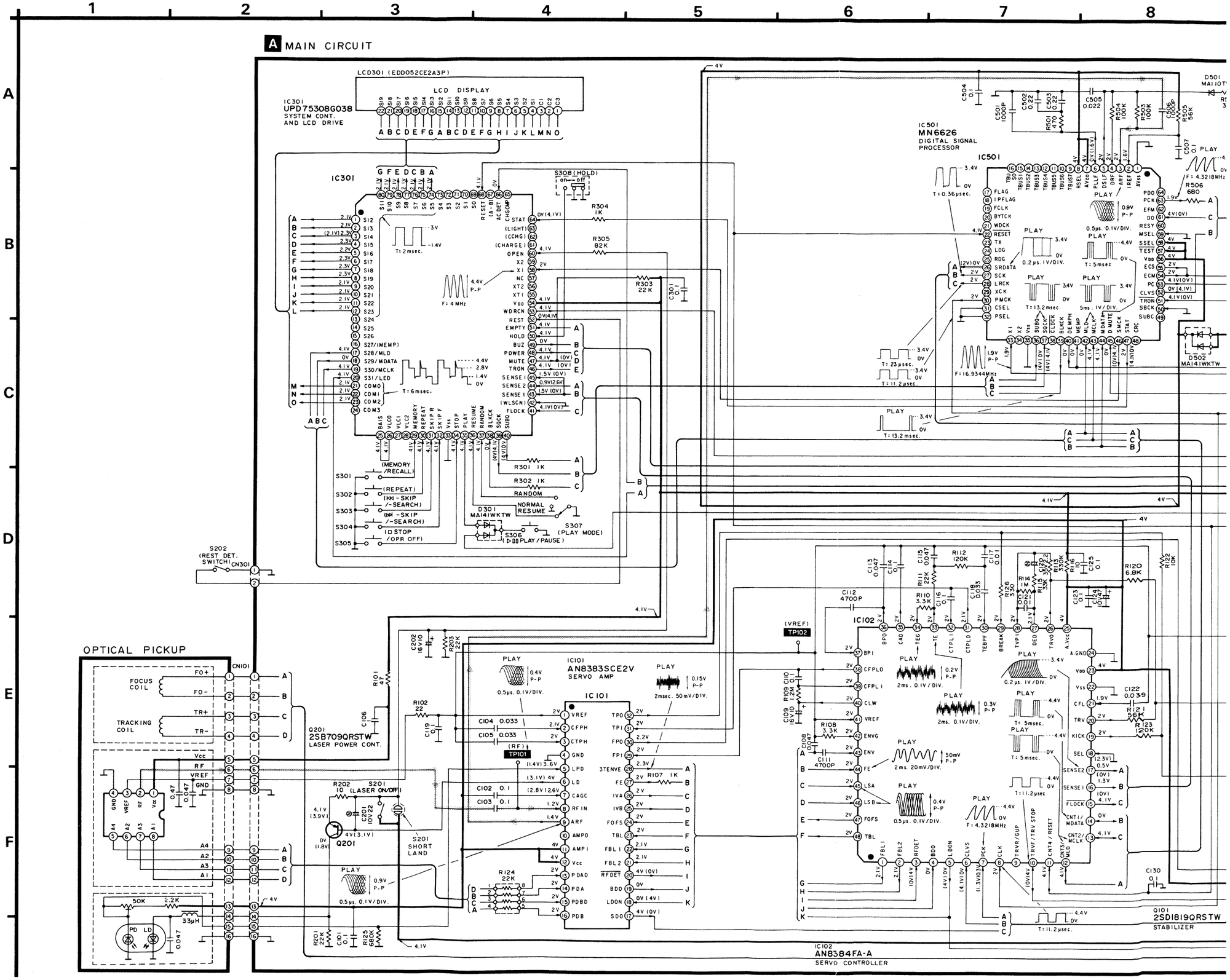
- **S201** : Laser ON/OFF switch in "**OFF**" position. (It turns "**ON**" with disc holder closed.)
- **S202** : Rest detector in "**OFF**" position. (It turns"**ON**" when optical pickup comes to innermost periphery.)
- **S301** : Memory/recall (MEMORY/RECALL) switch.
- **S302** : Repeat (REPEAT) switch.
- **S303,S304** : Skip/search (I◀◀ -SKIP/-SEARCH ▶▶I) switches. (S303: Backward, S304: Forward)
- **S305** : Stop/Operation off (■ STOP/OPR OFF) switch.
- **S306** : Play/Pause (▶II PLAY/PAUSE) switch.
- **S307** : Play mode selector (PLAY MODE) switch in "**RESUME**" position. (RESUME ↔ NORMAL ↔ RANDOM)
- **S308** : Hold (HOLD) switch in "**OFF**" position.
- **S701** : ASC/S-XBS selector (ASC/S-XBS) switch in "**OFF**" position. (OFF ↔ S-XBS ↔ ASC)
- The voltage value and waveforms are the reference voltage of this measured by DC electronic voltmeter (high impedance) and oscilloscope on the basis of GND terminal (DC IN Jack).
  Accordingly, there may arise some errors in the voltage values and waveforms depending upon the internal impedance of the tester or measuring unit.
  * The parenthesized is the voltage for test disc (1kHz, L+R, 0dB) in play mode, and the other, for no disc in stop mode.
  * AC adaptor is used for power supply.
- ▬▬ : Positive voltage lines.
- ⟿ : Audio signal lines.
- Important safety notice:
  Components identified by ⚠ mark have special characteristics important for safety. Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used. When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
- The supply part number is described alone in the replacement parts.

Part No.	Production Part No.	Supply Part No.
IC701	NJM3415MT1	NJM3415M

Caution!

IC and LSI are sensitive to static ellectricity.
Secondary trouble can be prevented by taking care during repair.

- Cover the parts boxes made of plastics with aluminum foil.
- Ground the soldering iron.
- Put a conductive mat on the work table.
- Do not touch the pins of IC or LSI with fingers directly.



8 9 10 11 12 13 14 15 16 17

IC601
MN6475A-TI
DIGITAL FILTER AND D/A CONV.

Q601
FMWIT98
STABILIZER

Q602
2SB709QRSTW
POWER SUPPLY

Q3
2SD1328STTW
REGULATOR

(Vcc) TP103 (GND) TP104

BATTERIES TWO "AA" SIZE 1.5V×2
RECHARGEABLE BATTERIES 1.2V×2

IC1
AN8086SE2
DC-DC CONV. CONTROL

Power supply voltage adj.

Q4,5
2SD1302STTA
SWITCHING

ICP1 SRUN50T25

Q1
DTA114TUT107
RESET SIGNAL DRIVE

Q802
FMG6T148
MUTING CONT.

Q803
DTA114YUT107
MUTING CONTROL

Q805
2SD1819QRSTW
REMOTE CONT

Q702,703
2SD1328RSTTW
MUTING

Q804
DTC124TUT107
REMOTE

Q801
DTC143ZUT107
DC IN DET.

Q603
FMG4T148
MUTING

Q701
DTC114TUT107
SWITCHING

Q709
DTA114TUT107
BEEP DRIVE

Q708
DTC114TUT107
BEEP DRIVE

Q706 Q704 Q705 Q707
2SD1328RSTTW
MUTING

IC103
AN8387SE2
MOTOR DRIVE
(TRAVERSE/SPINDLE)

IC104
AN8387SE2
COIL DRIVE
(FOCUS/TRACKING)

Q101
2SD1819QRSTW
STABILIZER

IC701
NJM3415MTI
HEADPHONES AMP

Q704 ~ 707
2SD1328RSTTW
MUTING

S701
(HIGH FILTER / XBS / OFF)

CN102 SPINDLE MOTOR
CN103 TRAVERSE MOTOR

CN701 HEADPHONES EARPHONES (ø3.5)

B INTERFACE CIRCUIT

CN4 CN5 CN6 CN7

C JACK CIRCUIT

CN8 DC IN 4.5V

CN601 OUTPUT

■ PRINTED CIRCUIT BOARD AND WIRING CONNECTION DIAGRAM

DIAGRAM (1)
(Upper side)

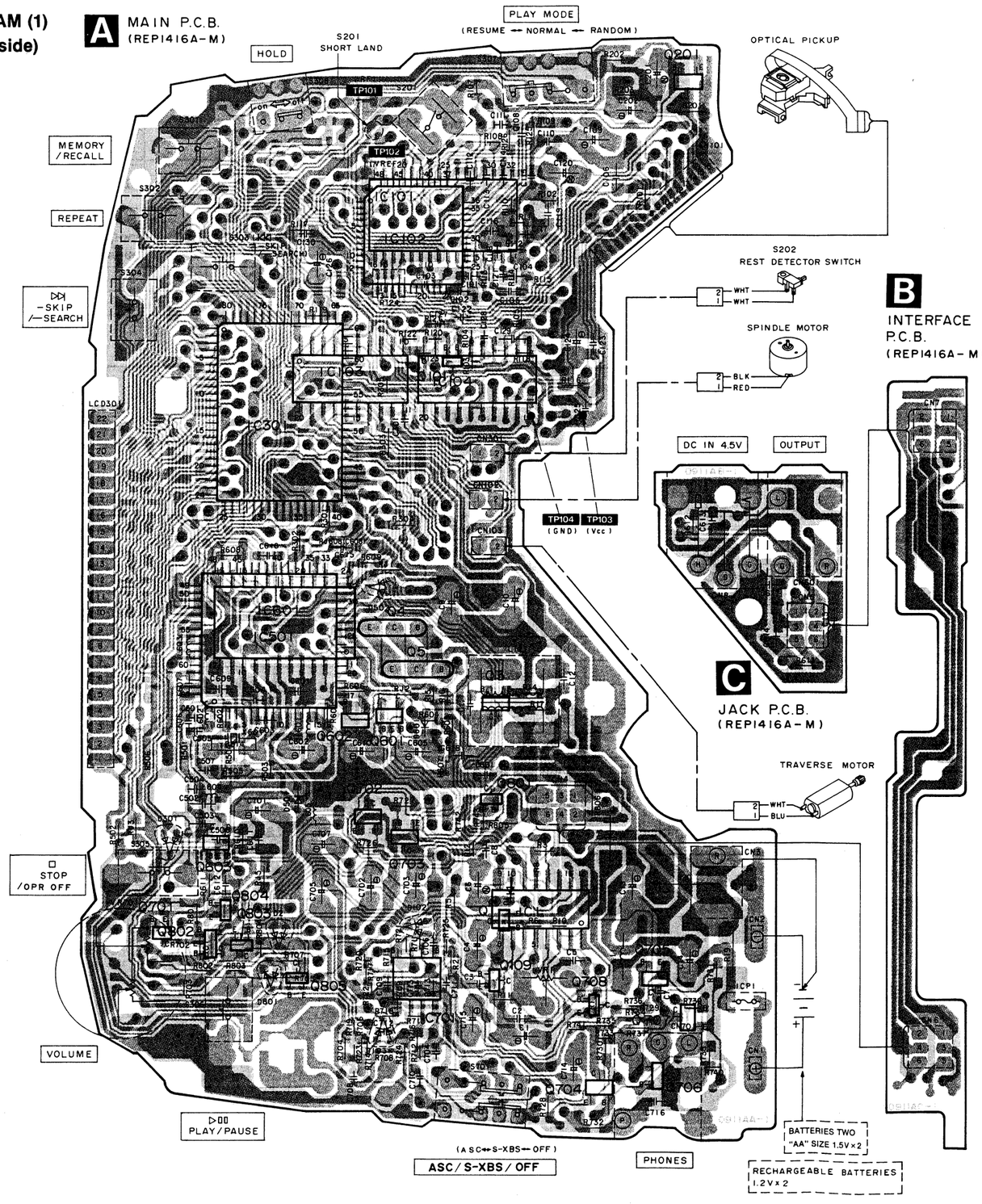
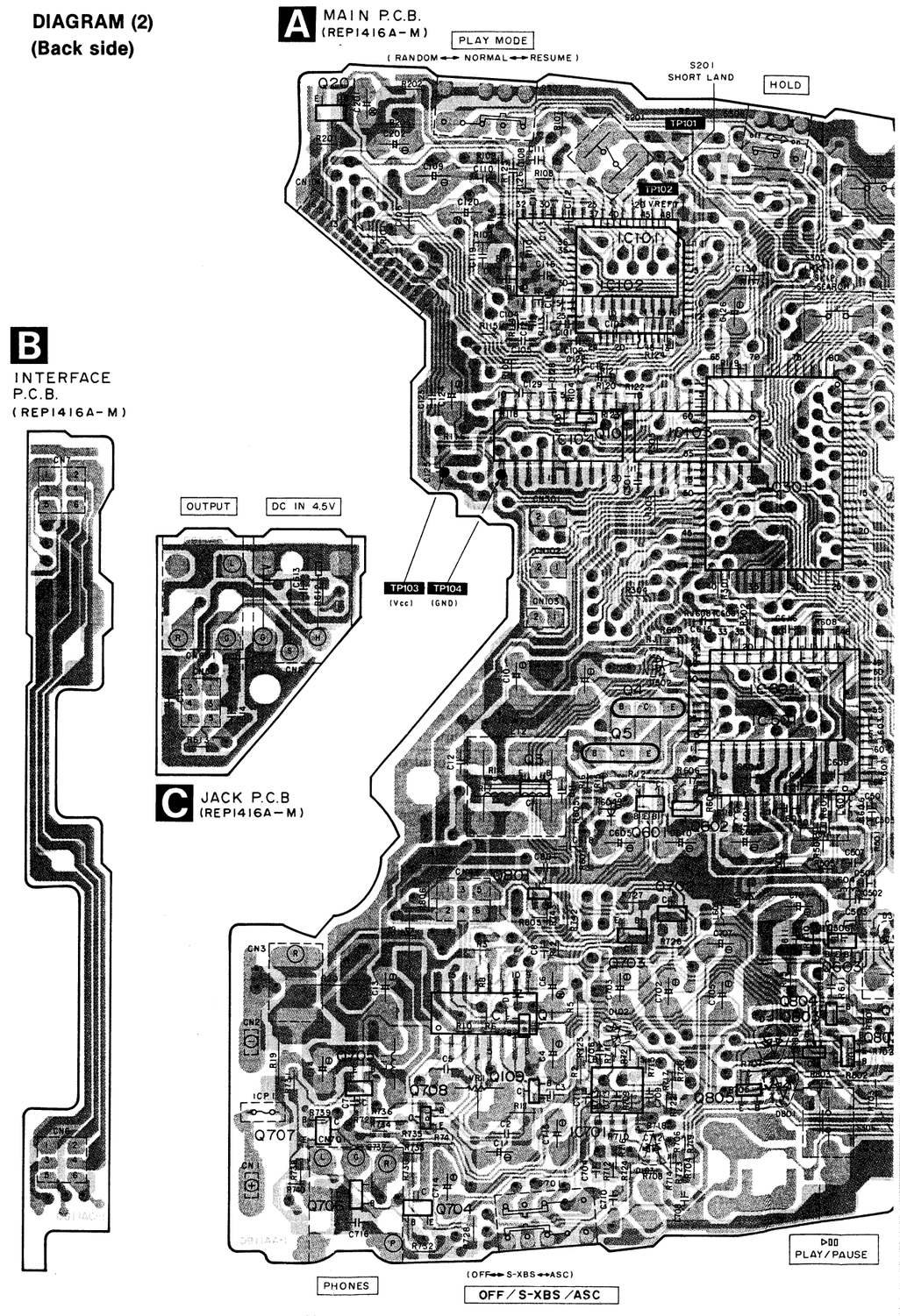
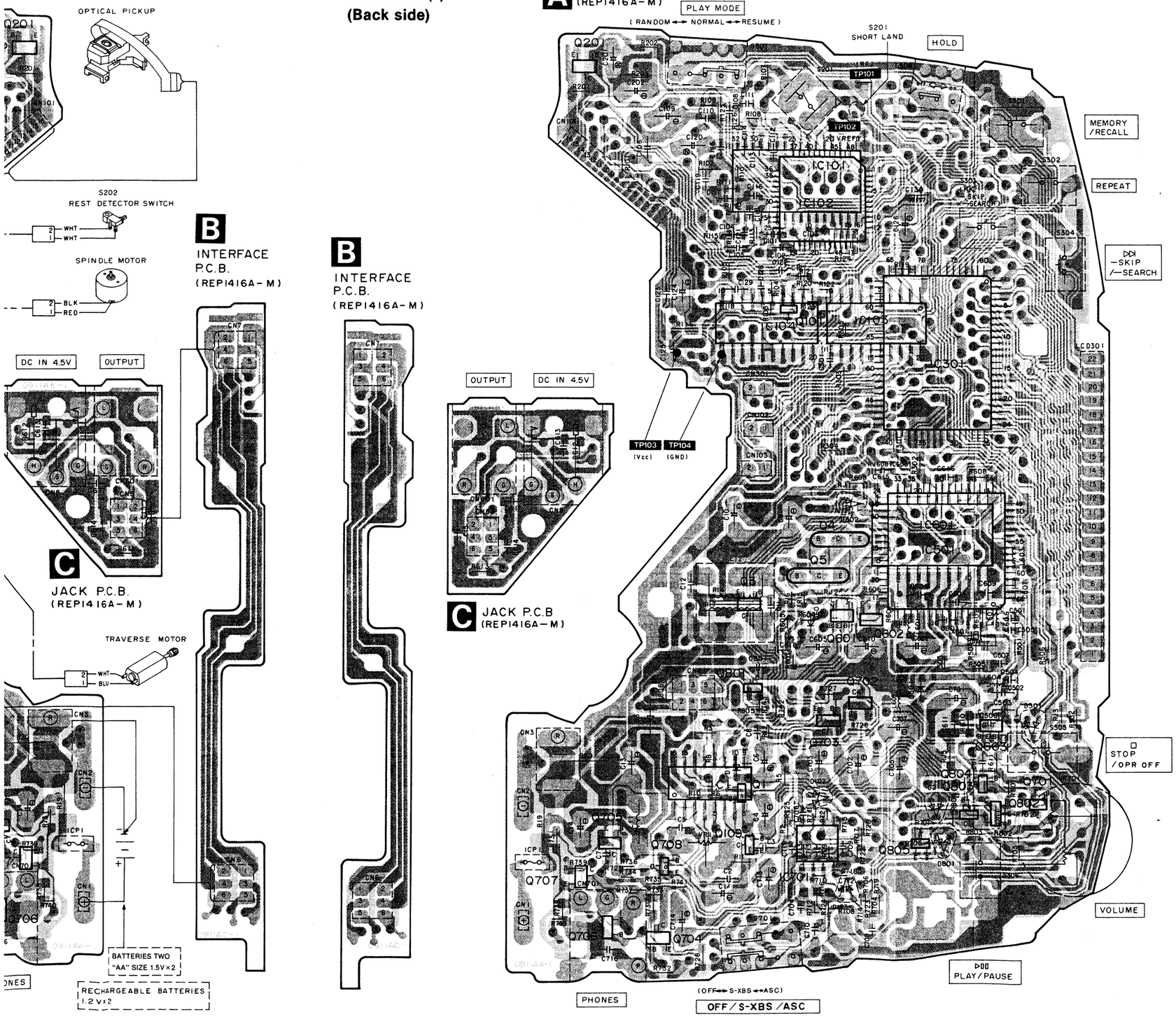


DIAGRAM (2)
(Back side)



AGRAM

DIAGRAM (2)
(Back side)



Notes:

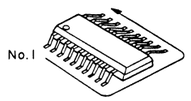
- The diagram (1) shows the view of LCD mounting surface (upper side).
  And the diagram (2) shows the view of back side surface.

1. The circuit shown in ( ) indicates the upper side of the printed circuit board.
2. The circuit shown in ( ) indicates the back side of the printed circuit board.
3. The symbols (●) shown in the circuit board indicates connection points between the upper side and back side on the circuit board.

Notes:

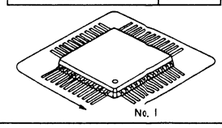
RED.....Red
BLK.....Black
BLU.....Blue
WHT.....White

• Terminal guide of IC's, transistors and diodes

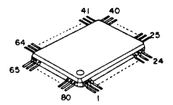


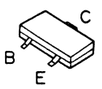
NJM3415MT1	8 Pin
AN8086SE2	16 Pin
AN8387SE2	20 Pin
MN6475A-T1	24 Pin
AN8383SCE2V	32 Pin

AN8384FA-A	48 Pin
MN6626	64 Pin



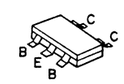
UPD75308G038





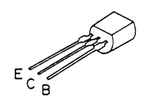
DTA114TUT107
DTA114YUT107
DTC114TUT107
DTC124TUT107
DTC143ZUT107
2SB709QRSTW

2SD1328STTW
2SD1328RSTTW
2SD1819QRSTW

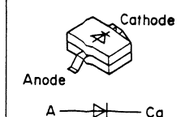


FMG6T148
FMW1T98
FMG4T148

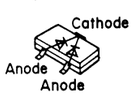
2SD1302STTA



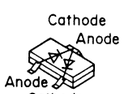
MA701TW



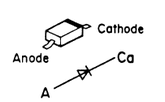
MA141WKTW



MA143TW



MA110TW



■TERMINAL FUNCTION OF IC'S

• IC1 (AN8086SE2): DC-DC converter control

Pin No.	Mark	I/O Division	Function
1	IN	I	Error amp input
2	FB	O	Error amp output
3	SPRO	I	Short protect input
4	DED	I	Dead time input
5	OUT	O	Switching output
6	GND	—	Ground terminal
7	CT	I	Triangular wave oscillator capacitor input
8	PVCC	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
9	CLK	I	Clock signal input (f=88.2kHz)
10	$\overline{START}$	I	Start detection input
11	POWER	I	Power ON/OFF detection terminal
12	VREF	O	Reference voltage output
13	EMP	O	Empty detection output
14	VSEN	I	Empty detection input
15	RESET	O	Reset signal output
16	VCC	I	Power supply terminal

• IC101 (AN8383SCE2V): Servo amp

Pin No.	Mark	I/O Division	Function
1	VREF	O	Reference voltage output
2	CFPH	I	Focus phase compensating capacitor terminal
3	CTPH	I	Tracking phase compensating capacitor terminal
4	GND	—	Ground terminal
5	LPD	I	Non-inverting laser power input
6	LD	O	Laser power auto control output
7	CAGC	I	AGC detecting capacitor terminal
8	RFIN	I	RF signal input
9	ARF	O	RF signal output
10	AMP0	O	RF signal output (Not used, open)
11	AMP1	I	RF signal input (×30 amp)
12	VCC	I	Power supply terminal
13	PDAD	I	Photo detector current input
14	PDA	I	Photo detector current input
15	PDBD	I	Photo detector current input
16	PDB	I	Photo detector current input
17	SDO	O	Dropout detection pulse output
18	LDON	I	Laser ON/OFF control input

Pin No.	Mark	I/O Division	Function
19	BDO	O	Dropout detection output
20	$\overline{RFDET}$	O	RF detection signal output
21	FBL2	I	PD balance adjustment terminal (PDB)
22	FBL1	I	PD balance adjustment terminal (PDA)
23	TBL	I	Tracking balance adjustment terminal
24	FOFS	I	Focus offset adjustment terminal
25	IVB	O	Current/voltage conversion output (B)
26	IVA	O	Current/voltage conversion output (A)
27	FE	O	Focus error signal output
28	3TENVE	O	3T envelope signal output
29	FPI	I	Focus phase compensating amp input
30	FPO	O	Focus phase compensating output
31	TPI	I	Tracking phase compensating input
32	TPO	O	Tracking phase compensating output

• IC102 (AN8384FA-A): Servo controller

Pin No.	Mark	I/O Division	Function
1	FBL1	O	PD balance adjustment (PDA) terminal
2	FBL2	O	PD balance adjustment (PDB) terminal
3	RFDET	I	RF detection signal input
4	BDO	I	Dropout detection input
5	LDON	O	Laser ON/OFF control output
6	CLVS	I	Spindle servo condition det. terminal ("H": CLV, "L": Rough servo)
7	PCK	I	PLL extract clock (f=4.3218MHz)
8	CLK	I	Frequency division clock signal (f=88.2kHz) input
9	TRVR/ GUP	I/O	Traverse backward input/gain up output (Not used, open)
10	TRVF/ TRV STOP	I/O	Traverse forward input/stop output terminal
11	CNT4/ RESET	I/O	CNT4 input/reset signal output terminal
12	CNT3/ MLD	I/O	CNT3 input/command load signal output terminal
13	CNT2/ MCLK	I/O	CNT2 input/command clock signal output terminal
14	CNT1/ MDATA	I/O	CNT1 input/command data signal output terminal
15	$\overline{FLOCK}$	O	Focus lock signal output
16	SENSE1	O	Selector output (1) terminal
17	SENSE2	O	Selector output (2) terminal
18	SEL	I	Parrallel/serial select terminal (Not used, connected to GND)
19	KICK	O	Track kick F/B control terminal
20	TRV	O	Traverse F/B control terminal
21	CFL	I	Capacitor connection terminal
22	VSS	—	Ground terminal
23	VDD	I	Power supply terminal
24	A. GND	—	Ground terminal
25	A. VCC	I	Power supply terminal
26	TRVO	O	Traverse amp. output terminal (2)

Pin No.	Mark	I/O Division	Function
27	DED	O	Traverse amp. output terminal (1)
28	TVPI	I	Traverse amp. input terminal
29	BREAK	I	Break input terminal
30	TEBPF	I	Tracking error gain detecting filter
31	CTPLO	O	Tracking low level compensation amp. output terminal
32	CTPLI	I	Tracking low level compensation amp. input terminal
33	TE	O	Tracking error output
34	TEG	I	Tracking SW amp. input
35	CAD	O	Auto adjustment multiplicator output terminal
36	BPO	O	Focus error for B.P.F. output terminal
37	BPI	I	Focus error for B.P.F. input terminal
38	CFPLO	O	Focus low level compensation amp. output terminal
39	CFPLI	I	Focus low level compensation amp. input terminal
40	CLW	O	Triangular wave oscillator output
41	VREF	I	Reference voltage input
42	ENVG	I	Envelope amp. gain adjustment terminal
43	ENV	I	Envelope amp. input terminal
44	FE	I	Focus SW amp. input terminal
45	LSA	I	Current/voltage conversion input (A)
46	LSB	I	Current/voltage conversion input (B)
47	FOFS	O	Focus offset adjustment output terminal
48	TBL	O	Tracking balance adjustment output terminal

• IC103, 104 (AI

Pin No.	Mark
1	S. VCC
2	IN1
3	PC1
4	VREF
5	P. GND
6	
7	S. GND
8	PC2
9	IN2

• IC601 (MN647

Pin No.	Mark
1	LRCLK
2	BCLK
3	SRDATA
4	COT 1
5	COT 2
6	TEST
7	DV_{DD}
8	X2
9	X1
10	DV_{SS}
11	AV_{DD} L
12	OUT. L
13	AV_{SS} L
14	AV_{SS} R
15	OUT. R

• IC102 (AN8384FA-A): Servo controller

Pin No.	Mark	I/O Division	Function
1	FBL1	O	PD balance adjustment (PDA) terminal
2	FBL2	O	PD balance adjustment (PDB) terminal
3	RFDET	I	RF detection signal input
4	BDO	I	Dropout detection input
5	LDON	O	Laser ON/OFF control output
6	CLVS	I	Spindle servo condition det. terminal ("H": CLV, "L": Rough servo)
7	PCK	I	PLL extract clock (f=4.3218MHz)
8	CLK	I	Frequency division clock signal (f=88.2kHz) input
9	TRVR/ GUP	I/O	Traverse backward input/gain up output (Not used, open)
10	TRVF/ TRV STOP	I/O	Traverse forward input/stop output terminal
11	CNT4/ RESET	I/O	CNT4 input/reset signal output terminal
12	CNT3/ MLD	I/O	CNT3 input/command load signal output terminal
13	CNT2/ MCLK	I/O	CNT2 input/command clock signal output terminal
14	CNT1/ MDATA	I/O	CNT1 input/command data signal output terminal
15	$\overline{\text{FLOCK}}$	O	Focus lock signal output
16	SENSE1	O	Selector output (1) terminal
17	SENSE2	O	Selector output (2) terminal
18	SEL	I	Parrallel/serial select terminal (Not used, connected to GND)
19	KICK	O	Track kick F/B control terminal
20	TRV	O	Traverse F/B control terminal
21	CFL	I	Capacitor connection terminal
22	VSS	—	Ground terminal
23	VDD	I	Power supply terminal
24	A. GND	—	Ground terminal
25	A. VCC	I	Power supply terminal
26	TRVO	O	Traverse amp. output terminal (2)

Pin No.	Mark	I/O Division	Function
27	DED	O	Traverse amp. output terminal (1)
28	TVPI	I	Traverse amp. input terminal
29	BREAK	I	Break input terminal
30	TEBPF	I	Tracking error gain detecting filter
31	CTPLO	O	Tracking low level compensation amp. output terminal
32	CTPLI	I	Tracking low level compensation amp. input terminal
33	TE	O	Tracking error output
34	TEG	I	Tracking SW amp. input
35	CAD	O	Auto adjustment multiplicator output terminal
36	BPO	O	Focus error for B.P.F. output terminal
37	BPI	I	Focus error for B.P.F. input terminal
38	CFPLO	O	Focus low level compensation amp. output terminal
39	CFPLI	I	Focus low level compensation amp. input terminal
40	CLW	O	Triangular wave oscillator output
41	VREF	I	Reference voltage input
42	ENVG	I	Envelope amp. gain adjustment terminal
43	ENV	I	Envelope amp. input terminal
44	FE	I	Focus SW amp. input terminal
45	LSA	I	Current/voltage conversion input (A)
46	LSB	I	Current/voltage conversion input (B)
47	FOFS	O	Focus offset adjustment output terminal
48	TBL	O	Tracking balance adjustment output terminal

• IC103, 104 (AN8387SE2): Motor/coil drive

Pin No.	Mark	I/O Division	Function
1	S. VCC	I	Power supply terminal
2	IN1	I	Spindle motor drive signal input and tracking coil drive signal input
3	PC1	I	Spindle motor power control signal input
4	VREF	I	Reference voltage input
5	P. GND	—	Ground terminal
6			
7	S. GND	—	Ground terminal
8	PC2	I	Traverse motor power control input (Not used, connected to GND)
9	IN2	I	Traverse motor drive signal input and focus coil drive signal input

Pin No.	Mark	I/O Division	Function
10	S. VCC	I	Power supply terminal
11	VLIM2	I	Voltage limit terminal
12	P. VCC	I	Power supply terminal
13	D2+	O	Traverse motor drive signal output and focus coil drive signal output
14	D2−		
15	P. GND	—	Ground terminal
16			
17	D1−	O	Spindle motor drive signal output and tracking coil drive signal output
18	D1+		
19	P. VCC	I	Power supply terminal
20	VLIM1	I	Voltage limit terminal

• IC601 (MN6475A-T1): Digital filter & D/A converter

Pin No.	Mark	I/O Division	Function
1	LRCLK	I	L/R discriminating signal
2	BCLK	I	Serial bit clock input
3	SRDATA	I	Serial data output (MSB first)
4	COT 1	I	Test terminal (Ordinaly: L)
5	COT 2		
6	TEST		
7	DV_{DD}	I	Digital power supply terminal
8	X2	O	Clock terminal (F=33.8688MHz)
9	X1	I	
10	DV_{SS}	—	Digital GND terminal
11	AV_{DD} L	I	Analog power supply terminal 1
12	OUT. L	O	Analog signal output 1
13	AV_{SS} L	—	Analog GND terminal
14	AV_{SS} R		
15	OUT. R	O	Analog signal output 2

Pin No.	Mark	I/O Division	Function
16	AV_{DD} R	I	Analog power supply terminal 2
17	$\overline{\text{RESET}}$	I	Reset signal input (Active: L)
18	PWM	O	PWM output (TP..."H": output "L": High impedance) (Not used, open)
19	TP	I	Test terminal (ordinaly: L)
20	WVEL	I	Double velocity ("H": double, "L": single)
21	DEMPH	I	Digital de -emphasis ON/OFF ("H": ON)
22	CSEL	I	Clock freqeuncy select of CK 192 (Not used, connected to GND)
23	192FS	O	192fs (8.4672MHz) signal output (Not used, open)
24	384FS	O	Clock output terminal (384FS=16.9344MHz)

• IC301 (UPD75308G038): System control & LCD drive

Pin No.	Mark	I/O Division	Function
1 ⟆ 12	S12 ⟆ S23	O	Segment signal output
13 ⟆ 16	S24 ⟆ S27/MEMP	—	Segment signal output (Not used, open)
17	S28/MLD	O	Command load signal output
18	S29/MDATA	O	Command data signal output
19	S30/MCLK	O	Command clock signal output
20	S31/LED	O	Remote control detection
21 ⟆ 23	COM0 ⟆ COM2	O	LCD common signal output
24	COM3	—	LCD common signal output (Not used, open)
25	BIAS	O	Power supply terminal for LCD drive (Not used, connected to each other)
26	VLC0	I	
27	VLC1	—	Power supply terminal for LCD drive (Not used, open)
28	VLC2		
29	MEMORY	I	Key switch (MEMORY/ RECALL) detection terminal
30	REPEAT	I	Key switch (REPEAT) detection terminal
31	SKIP R	I	Key switch (SKIP/SEARCH: Backward) detection terminal
32	SKIP F	I	Key switch (SKIP/SEARCH: Forward) detection terminal
33	VSS	—	GND terminal
34	STOP	I	Key switch (STOP/POWER OFF) detection terminal
35	PLAY	I	Key switch (PLAY/PAUSE) detection terminal
36	RESUME	I	Key switch (PLAY MODE: RESUME) detection terminal
37	RANDOM	I	Key switch (PLAY MODE: RANDOM) detection terminal
38	BLKCK	I	Sub-code block (Q data) clock (75Hz) output
39	SQCK	O	Sub-code Q register clock output
40	SUBQ	I	Sub-code (Q data) output
41	FLOCK	I	Focus lock signal input
42	WLSCN	I	Selector input (1) terminal

Pin No.	Mark	I/O Division	Function
43	SENSE 1	I	Selector input (1) terminal
44	SENSE 2	I	Selector input (2) terminal
45	SENSE 1	I	Selector input (1) terminal
46	TRON	O	Tracking servo ON signal (Tracking servo ON at "L")
47	MUTE	O	Muting signal output ("H": MUTE)
48	POWER	O	Power ON/OFF output terminal
49	BUZ	O	Beep control output terminal
50	HOLD	I	Hold ON/OFF detection terminal
51	EMPTY	I	Empty detection input terminal
52	REST	I	Rest detection terminal
53	WDRCN	O	Remote control signal output
54	VDD	I	Power supply terminal
55	XT1	—	Sub-system clock crystal terminal (Not used, open)
56	XT2		
57	NC	—	Not connected
58	X1	I	Main-system clock crystal terminal
59	X2	—	Main-system clock crystal terminal (Not used, open)
60	OPEN	I	Disc holder open detection terminal
61	CHARGE	—	Not connected
62	CCHG		
63	LIGHT	O	LED drive command signal (Not used, open)
64	STAT	I	Processing condition (CRC, CUE, CLVS, FCLV, TTSTOP) input
65	CHGCMP	—	Not connected
66	ACDET	I	Power supply detection signal input
67	A−B	—	Not connected
68	RESET	I	Reset detection terminal
69 ⟆ 73	S0 ⟆ S4	O	Segment signal output (Not used, open)
74 ⟆ 80	S5 ⟆ S11	O	Segment signal output

• IC501 (MN6626): Digital signal processor

Pin No.	Mark	I/O Division	Function
1	AVSS	—	GND terminal
2	IREF	I	Reference current input
3	ARF	I	RF signal input
4	DRF	I	DSL bias terminal (Not used, open)
5	DSLF	I/O	DSL loop filter terminal
6	PLLF	I/O	PLL loop filter terminal
7	AVDD	I	Power supply terminal
8	RSEL	I	RF signal polarity setting terminal (Not used, connected to VDD)
9 ⟆ 16	TBUS7 ⟆ TBUS0	O	Test terminal
17	FLAG	O	Flag terminal (Not used, open)
18	IPFLAG	O	Interpolation flag terminal (Not used, open)
19	FCLK	O	Crystal frame clock (Not used, open)
20	BYTCK	O	Byte clock (Not used, open)
21	WDCK	O	Word clock (Not used, open)
22	$\overline{\text{RESET}}$	I	Reset terminal
23	TX	O	Digital audio signal
24	LDG	O	Lch deglitch signal (Not used, open)
25	RDG	O	Rch deglitch signal (Not used, open)
26	SRDATA	O	Serial data output (MSB first)
27	SCK	O	Serial bit clock output
28	LRCK	O	L/R discriminating signal
29	XCK	O	Crystal OSC terminal (f=16.9344MHz) (Not used, open)
30	PMCK	O	Frequency division clock signal (Not used, open) ($f=\frac{1}{192}\times CK=88.2kHz$)
31	CSEL	I	Test terminal (Connected to GND)
32	PSEL		
33	X1	I	Crystal OSC terminal (f=16.9344MHz)
34	X2	O	Crystal OSC terminal (f=16.9344MHz) (Not used, open)
35	VSS	—	GND terminal
36	SUBQ	O	Sub-code Q data
37	SQCK	I	Sub-code Q register clock

Pin No.	Mark	I/O Division	Function
38	$\overline{\text{CLDCK}}$	O	Sub-code frame clock (f=7.35kHz) (Not used, open)
39	BLKCK	O	Sub-code block clock (f=75Hz)
40	DEMPH	O	De-emphasis ON signal ("H": ON)
41	MEMP	I	Emphasis signal
42	MLD	I	Command load signal ("L": LOAD)
43	MCLK	I	Command clock signal
44	MDATA	I	Command data signal
45	D MUTE	I	Muting Input ("H": MUTE)
46	SMCK	O	System clock (f=4.2336MHz)
47	STAT	O	Status signal (CRC, CUE, CLVS, TTSTOP, FCLV, SQOK)
48	CRC	O	Sub-code CRC check terminal ("H": OK, "L": NG)
49	SUBC	O	Sub-code serial output data (Not used, open)
50	SBCK	I	Sub-code serial input clock (Not used, connected to GND)
51	$\overline{\text{TRON}}$	I	Tracking servo ON signal ("L": ON)
52	CLVS	O	Turntable servo phase synchro signal ("H": CLV, "L": Rough servo)
53	PC	O	Turntable motor ON signal ("L": ON)
54	ECM	O	Turntable motor drive signal (Forced mode)
55	ECS	O	Turntable motor drive signal (Servo error signal)
56	VDD	I	Power supply terminal
57	$\overline{\text{TEST}}$	I	Test terminal (Normal: "H")
58	SSEL	I	"SUBQ" terminal mode select ("H": Q code buffer)
59	MSEL	I	"SMCK" terminal frequency select ("L": SMCK=4.2336MHz) (Connected to GND)
60	RESY	O	Re-synchronizing signal of frame sync. (Not used, open)
61	DO	I	Drop-out detection signal ("H": Drop-out)
62	EFM	O	EFM signal (Not used, open)
63	PCK	O	PLL extract clock (f=4.3218MHz)
64	PDO	O	Phase comparated signal of EFM and PCK (Not used, open)

■ REPLACEMENT PARTS LIST

Notes: *Important safety notice:
Components identified by ⚠ mark have special characteristics important for safety.
Furthermore, special parts which have purposes of fire-retardant (resistors), high-quality sound (capacitors), low-noise (resistors), etc. are used.
When replacing any of components, be sure to use only manufacturer's specified parts shown in the parts list.
*The parenthesized indications in the Remarks columns specify the areas. (Refer to the cover page for area.)
Parts without these indications can be used for all areas.
*Warning: This product uses a laser diode. Refer to caution statements on page 3.
*ACHTUNG: Die lasereinheit nicht zerlegen.
Die lasereinheit darf nur gegen einc vom hersteller spezifizierte einheit ausgetauscht werden.

Ref. No.	Part No.	Part Name & Description	Remarks
		INTEGRATED CIRCUIT(S)	
IC1	AN8086SE2	IC, DC-DC CONV. CONTROL	
IC101	AN8383SCE2V	IC, SERVO AMP	
IC102	AN8384FA-A	IC, SERVO CONTROLLER	
IC103, 104	AN8387SE2	IC, MOTOR/COIL DRIVE	
IC301	UPD75308G038	IC, SYSTEM CONTROL&LCD DRIVE	
IC501	MN6626	IC, DIGITAL SIGNAL PROCESSOR	
IC601	MN6475A-T1	IC, DIGITAL FILTER&D/A CONV.	
IC701	NJM3415M	IC, HEADPHONES AMP	
		TRANSISTOR(S)	
Q1	DTA114TUT107	TRANSISTOR	
Q3	2SD1328STTW	TRANSISTOR	
Q4, 5	2SD1302STTA	TRANSISTOR	
Q101	2SD1819QRSTW	TRANSISTOR	
Q201	2SB709QRSTW	TRANSISTOR	
Q601	FMW1T98	TRANSISTOR	
Q602	2SB709QRSTW	TRANSISTOR	
Q603	FMG4T148	TRANSISTOR	
Q701	DTC114TUT107	TRANSISTOR	
Q702-707	2SD1328RSTTW	TRANSISTOR	
Q708	DTC114TUT107	TRANSISTOR	
Q709	DTA114TUT107	TRANSISTOR	
Q801	DTC143ZUT107	TRANSISTOR	
Q802	FMG6T148	TRANSISTOR	
Q803	DTA114YUT107	TRANSISTOR	
Q804	DTC124TUT107	TRANSISTOR	
Q805	2SD1819QRSTW	TRANSISTOR	
		DIODE(S)	
D1	MA110TW	DIODE	
D2	MA141WKTW	DIODE	
D3	MA701TX	DIODE	
D102, 103	MA141WKTW	DIODE	
D301	MA141WKTW	DIODE	
D501	MA110TW	DIODE	
D502	MA141WKTW	DIODE	
D601	MA110TW	DIODE	
D801	MA143TW	DIODE	
		IC PROTECTOR(S)	

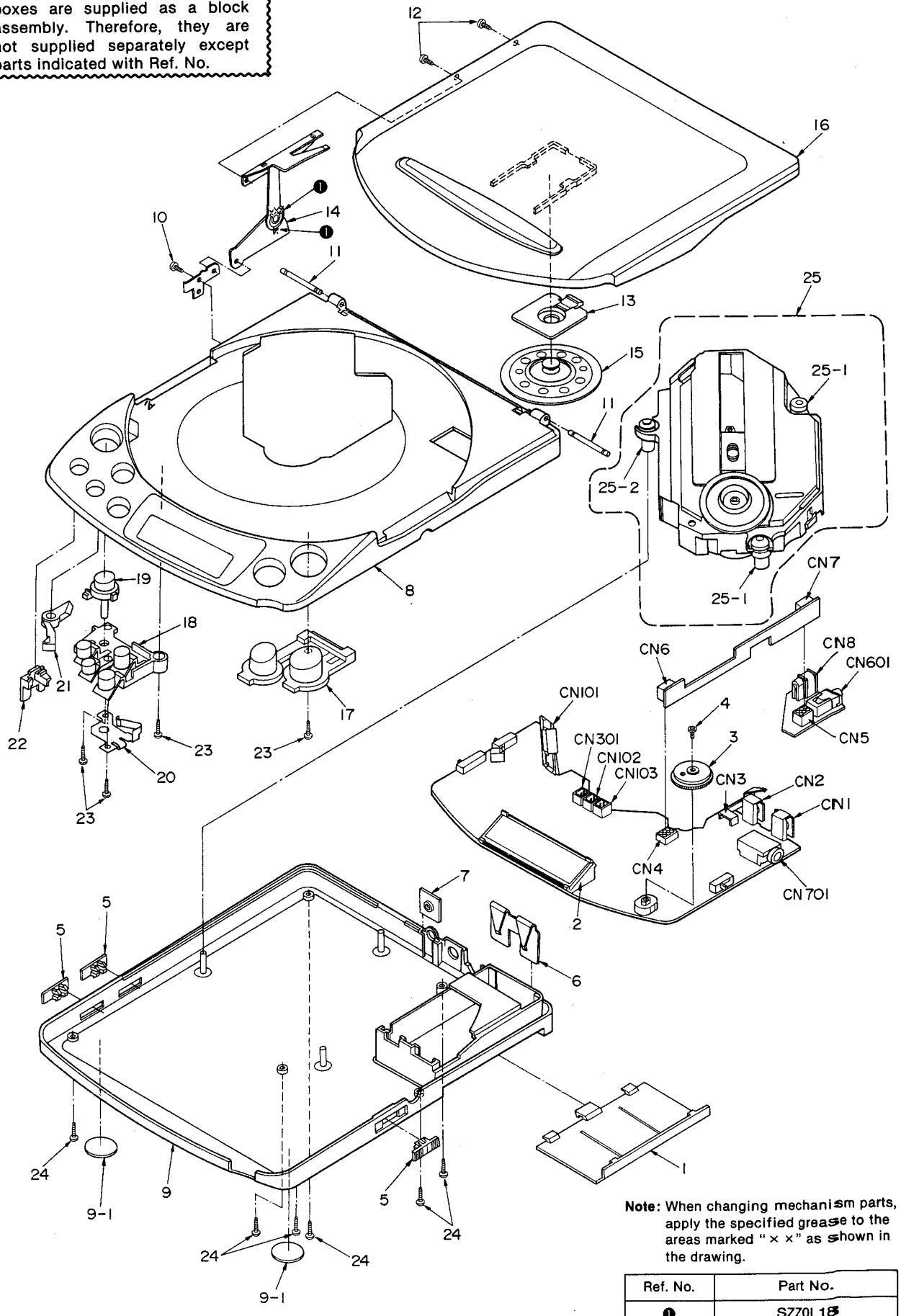
Ref. No.	Part No.	Part Name & Description	Remarks
ICP1	SRUN50T25	IC PROTECTOR	
		VARIABLE RESISTOR(S)	
VR1	EVNDXAA00B33	V. R, POWER SUPPLY VOLT. ADJ.	
VR701	EVUAMAT43C54	V. R, VOLUME	
		COIL(S)	
L11	RLQB330KT-K	COIL	
L12	RLZ0007-0	COIL	
L601-605	RLB0003	COIL	
		OSCILLATOR(S)	
X601	RSXZ16M9M01T	OSCILLATOR(16. 9344MHz)	
		LCD(S)	
LCD301	EDD052CE2A3P	LCD	
		SWITCH(ES)	
S201	RSH1A91ZA-A	SW, LASER ON/OFF	
S202	SSHD5	SW, REST DETECTOR	
S301	EVQ21405R	SW, MEMORY/RECALL	
S302	EVQ21405R	SW, REPEAT	
S303	EVQ21405R	SW, SKIP/SEARCH(B)	
S304	EVQ21405R	SW, SKIP/SEARCH(F)	
S305	EVQ21405R	SW, STOP/OPR OFF	
S306	EVQ21405R	SW, PLAY/PAUSE	
S307	ESD11H230	SW, PLAY MODE	
S308	ESD11H220	SW, HOLD	
S701	ESD11H230	SW, ASC/S-XBS	
		CONNECTOR(S) & JACK(S)	
CN1	RJC30002-3	BATTERY TERMINAL(+)	
CN2	RJC30002-3	BATTERY TERMINAL(-)	
CN3	RJH5102-1	RECHARGEABLE BATT. TERMINAL	
CN4, 5	RJT059W006	CONNECTOR(6P)	
CN6, 7	RJU059W006	SOCKET(6P)	
CN8	RJJ4303	DC IN JACK	
CN101	RJS1A6116	FPC CONNECTOR(16P)	

Ref. No.	Part No.	Part Name & Description	Remarks
CN102, 103	EMCS0255B	CONNECTOR (2P)	
CN301	EMCS0255B	CONNECTOR (2P)	
CN601	RJJD3S5ZA-C	LINE OUT JACK	
CN701	RJJD5S3MZA-C	HEADPHONES JACK	
		CABINET AND CHASSIS	
1	RKK0009-2K	BATTERY COVER	
2	RJF0011	LCD HOLDER	
3	SBND902K0A	KNOB, VOLUME	
4	XQN17+C3FZ	SCREW	
5	RGV0052-K	KNOB, ASC/PLAY MODE/HOLD	
6	RJC93007	COMMON BATTERY TERMINAL	
7	RMA0110	REAR ORNAMENT	
8	RYK0314A-K	INTERMEDIATE CABINET ASS'Y	
9	RFKJLXP330EB	BOTTOM CABINET ASS'Y	(EB, GC, GN)
9	RFKJLXP330EG	BOTTOM CABINET ASS'Y	(EG)
9-1	SHGD54-1	FOOT	
10	RHE5155YA	SCREW	
11	RMS0105-1	SHAFT	
12	RHE5097ZA	SCREW	
13	RMQ0163-1	CLAMPER HOLDER	
14	RXA0117	LINK ANGLE ASS'Y	
15	RXQ0218	CLAMPER	
16	RYF0178A-K	DISC HOLDER ASS'Y	
17	RGU0753-K	BUTTON, PLAY/STOP	
18	RGU0754-K	BUTTON, MEMORY/REPEAT/SKIP	
19	RGU0755-K	BUTTON, OPEN	
20	RMC0162	LOCK SPRING	
21	RML0260	OPEN LEVER	
22	RMR0560-W	LOCK PLATE	
23	XTN17+4J	SCREW	
24	XTN17+6GFZ	SCREW	
25	SODD100Z	TRAVERSE DECK	
25-1	SHGD165	FLOATING RUBBER (B)	
25-2	SHGD157	FLOATING RUBBER (A)	

Ref. No.	Part No.	Part Name & Description	Remarks
		PACKING MATERIAL	
P1	RPK0342	PACKING CASE	(EB, GC, GN)
P1	RPK0341	PACKING CASE	(EG)
P2	RPQF0045	ACCESSORIES BOX	
P3	RPQ00059	SPACER	(EG, GN)
P4	SPSD14	PROTECTION SHEET	
P5	RPN0609	CUSHION (LOWER)	
P6	RPN0610	CUSHION (UPPER)	
P7	SPPD1	PROTECTION BAG	
P8	SQZD7	AREA LABEL	(EB)
P8	SQZD6	AREA LABEL	(EG)
P8	RQLA0066	AREA LABEL	(GC)
P8	RQLA0067	AREA LABEL	(GN)
P9	RPQ00069-1	PAD	(EB, GC)
P9	RPQ00072-1	PAD	(EG)
P9	RPQ00070-1	PAD	(GN)
		ACCESSORIES	
A1	RQT1567-B	INSTRUCTION MANUAL	(EB, GN)
A1	RFKSLXP330EG	INSTRUCTION MANUAL ASS'Y	(EG)
A1	RQT1565-G	INSTRUCTION MANUAL	(GC)
A2	RP-HV135GY	STEREO EARPHONES	
A3	RFEA401B-W	AC ADAPTOR	(EB) ⚠
A3	RFEA401E-1S	AC ADAPTOR	(EG) ⚠
A3	RFEA402Z-W	AC ADAPTOR	(GC) ⚠
A3	RFEA401A-W	AC ADAPTOR	(GN) ⚠
A4	SJPD5-2K	STEREO CONNECTION CABLE	
A5	RQA0013	WARRANTY CARD	(EB, EG)
A5	RQX7433ZA	WARRANTY CARD	(GN)
A6	RP-BP60EY	RECHARGEABLE BATTERIES	(EB, EG)
A6	RP-BP60SY-1	RECHARGEABLE BATTERIES	(GC, GN)
A7	RQCB0169	SERVICENTER LIST	
A8	RJP120ZDS-K	AC PLUG ADAPTOR	(GC) ⚠
		<PRINTED CIRCUIT	
		BOARDS ASS'Y>	
PCB1	REP1416A-M	MAIN P.C.B. /INTERFACE	<NLA>
		P.C.B. /JACK P.C.B.	

■ CABINET PARTS LOCATION

The parts enclosed in the dotted boxes are supplied as a block assembly. Therefore, they are not supplied separately except parts indicated with Ref. No.



Note: When changing mechanism parts, apply the specified grease to the areas marked " × × " as shown in the drawing.

Ref. No.	Part No.
❶	SZZ0L18

■ RESISTORS & CAPACITORS

Notes : * Capacity values are in microfarads (uF) unless specified otherwise, P=Pico-farads(pF) F=Farads(F)
* Resistance values are in ohms, unless specified otherwise, 1K=1,000(OHM) , 1M=1,000k(OHM)

Ref. No.	Part No.	Values & Remarks
		RESISTORS
R1	ERJ6GEYJ103V	1/10W 10K
R2	ERJ6GEYJ224V	1/10W 220K
R3	ERJ6GEYJ333V	1/10W 33K
R5	ERJ6GEYJ472V	1/10W 4.7K
R6	ERJ3GEYJ224V	1/16W 220K
R8	ERJ3GEYJ333V	1/16W 33K
R10	ERJ3GEYJ472V	1/16W 4.7K
R11	ERJ6GEYJ122V	1/10W 1.2K
R12	ERJ3GEYJ101V	1/16W 100
R14	ERJ6GEYJ222V	1/10W 2.2K
R15, 16	ERJ3GEYJ220V	1/16W 22
R17	ERJ6GEYJ100	1/10W 10
R19	ERJ1WYK3R3H	1W 3.3
R20	ERJ1WYK3R9H	1W 3.9
R101	ERJ6GEYJ470V	1/10W 47
R102	ERJ3GEYJ220V	1/16W 22
R103	ERJ3GEYJ104V	1/16W 100K
R104	MCR03PZHJ561	1/16W 560
R105	ERJ3GEYJ223V	1/16W 22K
R107	ERJ3GEYJ102V	1/16W 1K
R108	ERJ3GEYJ332V	1/16W 3.3K
R109	ERJ3GEYJ125V	1/16W 1.2M
R110	ERJ3GEYJ332V	1/16W 3.3K
R111	ERJ3GEYJ223V	1/16W 22K
R112	ERJ3GEYJ124V	1/16W 120K
R113	ERJ3GEYJ334V	1/16W 330K
R114	ERJ3GEYJ105V	1/16W 1M
R115	ERJ3GEYJ333V	1/16W 33K
R116	ERJ6GEYJ100	1/10W 10
R117	ERJ6GEYJ184V	1/10W 180K
R118	ERJ3GEYJ103V	1/16W 10K
R119	ERJ6GEYJ182V	1/10W 1.8K
R120	ERJ3GEYJ682V	1/16W 6.8K
R121	ERJ3GEYJ563V	1/16W 56K
R122	ERJ3GEYJ103V	1/16W 10K
R123	ERJ3GEYJ124V	1/16W 120K
R124	EXBV8V223J	1/16W 22K
R125	ERJ6GEYJ684V	1/10W 680K
R126	ERJ6GEYJ331V	1/10W 330
R201	ERJ6GEYJ223V	1/10W 22K
R202	ERJ6GEYJ100	1/10W 10
R203	ERJ6GEYJ223V	1/10W 22K
R301, 302	ERJ6GEYJ102V	1/10W 1K
R303	ERJ8GEYJ223V	1/8W 22K
R304	ERJ6GEYJ102V	1/10W 1K
R305	ERJ3GEYJ823V	1/16W 82K

Ref. No.	Part No.	Values & Remarks
R501	ERJ3GEYJ471V	1/16W 470
R502	ERJ6GEYJ333V	1/10W 33K
R503, 504	ERJ3GEYJ104V	1/16W 100K
R505	ERJ3GEYJ563V	1/16W 56K
R506	ERJ3GEYJ681V	1/16W 680
R601	ERJ6GEYJ220	1/10W 22
R602	ERJ6GEYJ681V	1/10W 680
R604	ERJ3GEYJ682V	1/16W 6.8K
R605	ERJ3GEYJ104V	1/16W 100K
R606	ERJ6GEYJ222V	1/10W 2.2K
R607	ERJ3GEYJ392V	1/16W 3.9K
R608	ERJ6GEYJ681V	1/10W 680
R609-611	ERJ6GEYJ561V	1/10W 560
R612, 613	ERJ6GEYJ102V	1/10W 1K
R614	ERJ6GEYJ562V	1/10W 5.6K
R701	ERJ6GEYJ471V	1/10W 470
R702, 703	ERJ3GEYJ122V	1/16W 1.2K
R704, 705	ERJ6GEYJ102V	1/10W 1K
R706, 707	ERJ6GEYJ473V	1/10W 47K
R708, 709	ERJ3GEYJ105V	1/16W 1M
R710, 711	ERJ3GEYJ223V	1/16W 22K
R712, 713	ERJ3GEYJ105V	1/16W 1M
R714, 715	ERJ3GEYJ123V	1/16W 12K
R716, 717	ERJ6GEYJ154V	1/10W 150K
R718	ERJ3GEYJ103V	1/16W 10K
R719, 720	ERJ3GEYJ392V	1/16W 3.9K
R721	ERJ3GEYJ103V	1/16W 10K
R722, 723	ERJ3GEYJ682V	1/16W 6.8K
R724, 725	ERJ3GEYJ333V	1/16W 33K
R726, 727	ERJ6GEYJ821V	1/10W 820
R728, 729	ERJ6GEYJ120V	1/10W 12
R730, 731	ERJ6GEYJ100	1/10W 10
R732	ERJ6GEYJ221V	1/10W 220
R733	ERJ3GEYJ151V	1/16W 150
R734	ERJ3GEYJ471V	1/16W 470
R735	ERJ3GEYJ151V	1/16W 150
R736	ERJ3GEYJ471V	1/16W 470
R737, 738	ERJ6GEYJ104V	1/10W 100K
R739, 740	ERJ3GEYJ222V	1/16W 2.2K
R741	ERJ3GEYJ681V	1/16W 680
R742, 743	ERJ6GEYJ473V	1/10W 47K
R801	ERJ3GEYJ474V	1/16W 470K
R802	ERJ3GEYJ333V	1/16W 33K
R803	ERJ3GEYJ182V	1/16W 1.8K
R804	ERJ3GEYJ274V	1/16W 270K
R805	ERJ3GEYJ223V	1/16W 22K
R806	ERJ6GEYJ102V	1/10W 1K
		CHIP JUMPERS

Ref. No.	Part No.	Values & Remarks
RJ1, 2	ERJ8GEY0R00V	CHIP JUMPER
RJ3	ERJ6GEY0R00V	CHIP JUMPER
RJ5	ERJ6GEY0R00V	CHIP JUMPER
RJ608	ERJ3GEY0R00V	CHIP JUMPER
		CAPACITORS
C1	ECEA1EKA4R7I	25V 4.7U
C2	ECUV1C104KBN	16V 0.1U
C3	ECUV1H331KBN	50V 330P
C4	ECEA1HKA010I	50V 1U
C5	ECUV1E103KBN	25V 0.01U
C6	ECEA1HKN2R2I	50V 2.2U
C7	ECUV1C104ZFV	16V 0.1U
C8	ECUV1E103KBV	25V 0.01U
C9	RCE1ASD330IX	10V 33U
C10	ECEA0JKA101I	6.3V 100U
C11	ECUV1H470KCN	50V 47P
C12	ECUVNC105ZFN	16V 1U
C13, 14	ECEA1AKA470I	10V 47U
C15	ECUV1C104ZFN	16V 0.1U
C101	ECUV1C104ZFN	16V 0.1U
C102, 103	ECUV1C104KBN	16V 0.1U
C104, 105	ECUV1C333KBN	16V 0.033U
C106	ECUV1C105ZFM	16V 1U
C108	ECUV1C473KBN	16V 0.047U
C109	ECEA1CKA100I	16V 10U
C110	ECUV1C104KBN	16V 0.1U
C111	ECUV1H472MBV	50V 4700P
C112	ECUV1H472MBN	50V 4700P
C113	ECUV1C473KBN	16V 0.047U
C114	ECUV1C104KBN	16V 0.1U
C115	ECUV1C473KBN	16V 0.047U
C116	ECUV1C104KBN	16V 0.1U
C117	ECUV1E103KBV	25V 0.01U
C118	ECUV1C333KBV	16V 0.033U
C119	ECUV1C104ZFN	16V 0.1U
C120	ECEA1VKN2R2I	35V 2.2U
C121	ECUV1E103KBV	25V 0.01U
C122	ECUV1C393KBN	16V 0.039U
C123	ECUV1C104ZFN	16V 0.1U
C124	ECEA1AKA470I	10V 47U
C125	ECUV1C104ZFN	16V 0.1U
C126	ECEA1HKSR47I	50V 0.47U
C127	ECUV1C104ZFN	16V 0.1U
C128	ECUV1E103KBV	25V 0.01U
C129	ECUV1C154KBM	16V 0.15U
C130	ECUV1C104ZFV	16V 0.1U